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SUPPLEMENTARY READING MATERIAL FOR THE INTELLECTUALLY GIFTED CHILD IN THE THIRD GRADE BASED ON A UNIT IN SCIENCE

Submitted by

Eve Helen Feldman

(B.S.E. Teachers College, Boston, 1934)

In partial fulfillment of requirements for the degree of
Master of Education

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CHAPTER I

DEFINITION OF PROBLEM AND JUSTIFICATION OF IT

Code

Community A	Belmont
Community B	Brookline

CHAPTER I

Definition of Problem and Justification of it.

~~It is~~ the purpose of this paper study to describe some of the characteristics and needs of the intellectually gifted child and to give suggestions as to a means of satisfying these needs. Through the review of research an attempt has been made to show the lack of materials to challenge the mental capacity of the very superior group.

This study attempts to show how a science program may stimulate the superior child in the third grade to purposeful thinking and further activity. This is done through a workbook based on a unit in science.

Another purpose of the study is to show that the science program need not be an isolated one, but one that can be easily integrated with other school subjects such as citizenship, health, language arts and further development of reading and art.

This study is an effort to supplement the lack, in the average program, in meeting the needs of the superior child in the third grade, by supplying sample unit exercises which attempt to stimulate him to further purposeful thinking and creative activity. These exercises also attempt to develop his capacity for collecting and organizing data so that he may transmit it to his less gifted classmates.

It is the contention of educators that we must satisfy individual differences, but it has been within the experience of this writer that the mentally handicapped have been considered to a greater degree than have those of great mental endowment. In books written by educators concerning the gifted child, a great many theories are proposed, but very little information is given in regard to specific material built to the needs of the exceptionally bright child. No definite course of study is suggested for the teacher of these pupils in the average classroom.

Since the gifted child has the ability to handle material involving the higher mental processes and interpret abstract ideas, a unit based on science seems justifiable.

Who are the gifted children and how can we identify them? There are many arbitrary classifications. The following is that of Professor Lewis M. Terman:[1]

	IQ
Genius or near genius	above 140
Very superior	120-140
Superior	110-120
Average	90-110
Dull normal	80-90
Dull	70-80
Feeble-minded	below 70

1/ L. M. Terman, Genetic Studies of Genius, Vol. I., Stanford University Press, Edition II, Stanford University, Cal., 1926, p. 23.

Professor Leta Hollingworth[1] identifies the intellectually gifted in this way: "We mean by gifted children those who test above average on standard scales for the measuring of intelligence and also those who test much above on scales for measuring of the talents."

Adams and Brown[2] list these mental, physical, social, and emotional characteristics of bright pupils:

1. A high degree of general intelligence
2. Unusual powers of analysis and of general reasoning ability
3. Attention span longer than the average and dull
4. Better understanding of ability to follow directions
5. Originality, resourcefulness, initiative, play of imagination, and ability to interpret abstract ideas more highly developed than the average
6. Keen recognition of related material; therefore stimulating search for reference material pertinent to the lesson
7. Thoughts and illustrations related to like situations
8. Learning through mistakes and avoiding errors
9. Possession of natural aggresive interest in most subjects requiring less teacher motivation
10. Strong desire to read (Gifted child of seven, chronologically, reads more than average child of fifteen)
11. General abilities
12. Superiority evident in early life and little influence of informal instruction
13. Often underestimated by parents and occasionally by selves
14. Often have home advantages of superior cultural conditions
15. As a group, are taller, heavier, and stronger than average
16. Though accelerated on basis of chronological age, retardation of two or three grades on basis of mental age

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1/ L. S. Holling~~s~~worth, Gifted Children of New York, The Macmillan Co., 1926, p. 42.

2/ F. Adams and W. Brown, Teaching the Bright Pupil, Henry Holt and Co., New York, 1930, p. 24.

17. Usually small for grade but large for age
18. Average to above average in nervous stability
19. Marked superiority in moral and personal traits
20. Usually good citizens with satisfactory general deportment
21. Sometimes source of worry to teacher because of mental superiority
22. Resentment of corporal punishment more than average child of same chronological age.
23. Kindness and tact on part of elders resulting in better discipline
24. Interest in play and tendency to choose playmates of own mental age
25. Pronounced desire to be leaders
26. Usually superior lineage

Professor Carroll[1] makes this specification:"The gifted child is one who has an exceptional intelligence which finds expression in high levels of creative thinking and reasoning."

Thorndike[2] advances this idea about the gifted child: "... exceptionally high degree of ability to work with ideas."

It has been found that in kindergarten and the beginning of the first grade, the majority of bright children make unusually high grades in the reading readiness tests. Detailed research shows that their vocabulary, their unique forms of sentence structure, their diversified fund of information, their ability to cope with problem situations, and their audio-visual discrimination is appreciably higher than that of their classmates.[3]

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[1] H.A.Carroll, Genius in the Making, McGraw-Hill Book Co., New York, 1940, p. 13.

[2] R. L. Thorndike, "Problems in Identification, Description, and Development of the Gifted." Teachers College Record, Vol. 4 42, Feb. 1941, p. 402-406.

[3] W. S. Gray, "Education of the Gifted Child, with Special Reference to Reading" Elementary School Journal, Vol. 42, June 1942, p. 736.

Very often children have been mistakenly identified as exceptionally bright according to one of these four classifications:[1]

1. Those children endowed with a good memory
2. Those children whose physical and mental growth is generally more rapid than ordinary children, without pathological precocity
3. Those children having one faculty or a group of related faculties
4. Those children having general excellency with neuropathic and psychopathic tension

Many children in school have a great deal of success but this does not necessarily indicate real mental superiority. Because of their retentive memories they sometimes make very rapid progress through the grades. We are easily mistaken in identifying these children as superior because they seem to learn quickly and have the ability to recall very easily what they have learned.

Dr. Paul Carus[2] has described the genius as one who can perform an important piece of work with unusual ease. He also states that genius is an instict on a higher plane.

Terman[3] defines a gifted child as one "whose score in tested intelligence is equalled by only one in two hundred of the school population."

1/ M.P.E.Groszmann, Exceptional Child,Chas. Scribner's Sons, 1917, p. 106.

2/ W. S. Gray, loc. cit.

3/ L.M.Terman, "The Gifted Student and His Academic Environment." School and Society, Vol. 49, 1939, p. 65.

Osburn and Rohan [1] say this about identifying the intellectually gifted:

> Selecting the gifted, talented, or superior is a difficult task. Interest is as important a sign of intelligence as is class-standing. In the past, standings were almost the only criteria. Many successful people failed in school, not because of inability, but because they refused to do the work. Hasty conclusions that have a negative result on the pupil should be avoided. Possibly, pupil failure is a school failure. Standard tests help to reveal the exceptional pupil. These have their faults; nevertheless, they are a decided help. They cover the verbal intelligence and have commenced to cover the field of mechanical and aesthetic intelligence. The teacher and her methods are important factors in finding the bright, but her judgment must be carefully checked so that erroneous conclusions may be guarded against.

In 1940 Carroll [2] proposed this idea:

> There are a number of possible ways of identifying these gifted children. Parents' judgment, teachers' judgment, age-grade status, standardized achievement tests, and school marks constitute the usual criteria for selection. Not one of these is completely valid, although the intelligence test is by far the best. Whenever possible, a combination of estimates should be used.

The value of education in the field of science for the layman lies in the fact that teaching of scientific attitudes may help to develop in the individual the ability to think in terms of scientific truths. The aim of this guidance is not mastery of small content items but an understanding of significant concepts which may add to the growth and interpretation of the knowledge that has been handed down through

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1/ W. J.Osburn, and B. J. Rohan, Enriching the Curriculum for Gifted Children, Macmillan Co., New York, 1939, p. 97.

2/ H. A. Carroll, op. cit., p. 6.

the generations and the problems of new experiences.[1]

If ideas and experiences are constantly being built up so that the individual is exposed to them, he will be influenced by them, both in thinking power and in actions. To carry out, effectively, the establishment of scientific attitudes and conceptions, a background of experiences must be initiated as early in the child's school career as possible. His powers of observation become keener to the conditions about him, and he becomes familiar with simple scientific vocabulary.

The field of science is a challenge to the child at the earliest school level. It is a field of great wealth of thought provoking situations for the intellectually gifted. His creative abilities are brought into play by a desire to perform experiments; the experiments motivate the need to further reading; and the accumulated interest develops a capacity for collecting data. The organization of the material collected for the transmission to the less gifted classmates can be easily motivated,or, if the experiments are presented in a meaningful manner, it will be self-motivated.

1/ Gerald S. Craig, Science for the Elementary School Teacher, Ginn and Co., Boston, 1940, p. 8.

CHAPTER II

REVIEW OF RESEARCH

CHAPTER II

Review of Previous Research

As stated in Chapter I many educators have done a great deal of research concerning the gifted child. However, there is very little scientific information available, and many of the theories proposed are opinions of various educators. Moreover, these proposals are not substantiated by concrete suggestions for the teachers of the exceptionally bright child in the same classroom with the average child.

Miss Johnson,[1/] of the Public Schools of Pasadena, California, speaks of her reaction on being assigned to an intellectually gifted group, in this way:

> I felt like a good family dressmaker who had given fairly good satisfaction for a number of years and was suddenly made a modiste! Here was all this beautiful material out of which I was expected to turn creations,- authors, composers, poets, clergymen, president, and movie actors! Silk and velvets, gold cloth, and laces but not even a picture to look at!

Scores of writers will proclaim the depth of the powers of these gifted people. Some suggest special classes for them. Others say that a specially trained teacher with great creative powers should teach them. Where can these teachers be found, and how many cities' budgets can afford them? Goddard,[2/] in his book, tells that special consideration of the

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[1/] C.F.Johnson, "The Gifted Primary Child": Educational Methods, 10:456-8, May, 1931.

[2/] H.H.Goddard, School Training of Gifted Children: World Book Co., New York, N. Y., 1928, p. 1.

exceptional child has covered a period of sixty years. There are three schools of thought mentioned:

A. Flexible promotion

This was started by Dr. William T. Harris, in the St. Louis Schools, about 1867. For about thirty years rapid promotion for rapid learners was advocated.

B. Rapid Advancement Classes

This period emphasized the saving of time. Children were picked from the regular classes and placed in special classes, where they completed two years work in one year, or three years' work in two. This started at the beginning of the twentieth century and was the first real recognition of the gifted in schools.

C. Enrichment

During this period, about 1920, the emphasis was not on saving time, but upon keeping the child happily busy with work that is educational, because it is interesting to him, and because it challenges his capabilities. This is the first system that recognized, to any degree, that in education the gifted children presented a new problem; and that the new problem must be solved by a new method, and not by adaptations of an old method.

Dransfield[1] is in favor of enrichment at the earliest possible moment in the child's life. "Enrichment units should be available in great numbers, covering many fields of learning and vocations." The pupils' needs should be determined as early as possible and a course of enrichment should be laid out for his entire school life.

An experiment was conducted in which the pupil was "required to devote to the subject matter of the group in which he is working only so much time as is necessary to maintain the level of that group. The extra time which his ability or industry permits to be used for education in the fullest sense broadening along some line which his interest or future welfare dictates."[2] It is believed that this procedure will eliminate faulty work habits and the tendency toward conceit.

The easiest solution, so John C. Sullivan[3] thinks, is to segregate the gifted children and have a specially trained teacher in charge who can develop a program of activity and

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[1] Dransfield, J. Edgar, Administration of Enrichment to Superior Children in the Typical Classroom. Contribution to Education #558, Bureau of Publications Teachers College Record. New York, 1933, p. 53.

[2] *Ibid.*, p. 15.

[3] John C. Sullivan: "Adequate Education for the Intellectually Superior Child" *Journal of Exceptional Children*, Nov. 1946, 13: 44-48.

study. He states that such a program is being followed in many school systems, thus eliminating an accelerated program. It was found that acceleration was inadvisable because it didn't provide sufficient time for mastery of tool subjects. This idea of segregation is refuted by some educators who feel that this practice precludes the gifted child from being integrated into the life and activities of the school, thus limiting opportunities to further his social growth. Sullivan suggests, further, that a specially prepared person could assist the regular classroom teacher in the planning of individual activities for the superior children, within a group of average children.

In comparison with the interest shown in the mentally retarded children, the interest shown in the intellectually gifted children is negligible. In Professor Hollingworth's Children Above 180 IQ[1] she states:

> Children of very superior intelligence are not, as a group, socially annoying. Society studies that which is socially annoying. The school attends to those who give it trouble. Thus, feeble-minded children have long been studied. Millions of dollars have been spent in considering them, and a voluminous literature has grown up through prolonged investigations of the maladjustments. Gifted children, on the other hand, have been studied hardly at all. Such investigations as we have, are the result of intellectual interest on the part of a few educators and psychologists, who, in the course of mental surveys, became interested in those children who test always at the top.

1/ Leta S. Hollingworth: Children Above 180 IQ, Macmillan Co., New York, 1940, p. 267.

In the field of education, the exceptionally bright child is recognized, although not much scientific information is available. Until very recently, there was a lack of interest in this area. This might have been due to the financial encumbrance and indifference of the public.

Hatch[1] makes these general conclusions concerning the gifted child: The gifted child has great ability to cope with abstract ideas, on a high level, and is ingenious in creative thinking and reasoning; there is a need for more tests and scientific data; there are no exact criteria for determining the superior pupils, but parents' judgment, school marks, teachers' judgment, age-grade status, mental, physical, social and emotional characteristics are added to mental and standardized tests.

Various surveys show that the low A. A. and high IQ are an indication of a waste of intellectual power, and that there is little being done in our school systems to prevent this waste. Another phase of this problem that is still undeveloped is a definite measure to determine what will prove most valuable to the bright child, and what teacher techniques should be employed in catering to their intellectual needs.[2]

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[1] Mabel Tukey Hatch: A Study of the Research Done on the Gifted Child for the Past Three Decades. Unpublished Service Paper, Boston University, 1944.

[2] Ibid.

She[1] concludes, specifically: The most important consideration in education is the curriculum,- either new or enriched; the gifted child's grade placement should be placed on his mental capacity, physical development, and social maturity; the gifted child is physically superior to the average child; the gifted child should not be made the center of attraction; the exceptionally bright child has the same traits that the average child has, only in a different degree; not all leaders are gifted children because their environment is not conducive to achievement.

The highest goal in any educational system is building a curriculum so that the needs of each individual may be satisfied. Yet, how much progress has been made in just ascertaining the needs of the intellectually gifted, let alone satisfying them?

Although writers talk about encouraging superior ability, how much provision for these pupils is made in the average classroom? Some educators believe that the superior child will get along anyway, and that they should not be given special education because it is not democratic.[2]

1/ Ibid.

2/ R. Pintner, Superior Ability, Teachers College Record, Columbia University, New York, Feb. 1941, p. 407.

Many solutions to the problem of education of the superior child have been advanced. These include ability grouping, enrichment of curriculum, rapid advancement classes and special classes, as has been previously stated. Each presents its difficulties. Most communities do not have special classes for the exceptionally bright child and very little interest is shown in him. Our school systems, like so much machinery, are geared to suit the average.[1]

The teacher has a great responsibility toward the gifted child. She must give him an incentive to use, constructively, his creative power. She must let him have the freedom to develop and not be confined to the daily assignments of the average pupil. Above all, she must let him express his interests and show his abilities. In this way his attitudes, work skills, and study habits will develop to their fullest extent.[2]

Even though the gifted child has a wide scope of interests he needs instruction in study habits and basic skills. These may be attained by fulfillment of specific goals.[3]

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[1] Elise H. Martens, United States Office of Education, 1940. Pamphlet No. 41, p. 12 *Teachers' Problems with the Exceptional Children-Gifted Children*

[2] *Ibid.*

[3] U. S. Office of Education, loc. cit.

One of the most vital contributions of psychology to education is that we can determine the mental caliber of a human in his early years. As time goes on, it becomes clear that activities concerning human welfare depend upon the superior people and not the activities of the average. It is this deviating group that takes the initiative and plays the important role in social determination.[1]

It behooves us to be greatly concerned about the education of our gifted children. These children are the nation's most precious resource. Utilization of these children's latent powers and conservation of an education program to promulgate their potentialities will prove far more valuable than natural resources.[2]

Pierre Samuel du Pont de Nemours[3] says, "A single day of an educated man of genius is of more value to the world than the labor of a thousand average for a year."

Franklin Lane[4] states, "Progress means the discovery of the capable. They are natural masters. They lead because they have the right, and everything done to keep them from rising is a blow to our civilization."

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[1] F. K. Lane, "Education for Gifted Pupils in the Secondary Schools of Los Angeles." Journal of Education Sociology, Oct. 1939, p. 101.

[2] H.W. Zorbaugh and R.K.Boardman, "Salvaging Our Gifted Children", Journal of Educational Sociology. Vol. I., Oct. 1936, p. 100.

[3] R. Pintner, op. cit. p. 413.

[4] F. K. Lane, op. cit. p. 104.

Harold G. Campbell[1] says, "Education is something more than the process of guiding youth out of the realm of incompetence. More particularly, today, education is charged with the obligation of providing every possible opportunity for superior young people."

The White House Conference Report[2] on the education of the gifted says, "It is almost a social crime to neglect these highly endowed children, and failure to develop the very bright to their highest capacity represents waste of the kind we can least afford."

Pintner[3] states in his book:

> Individuals of great endowment are rare. They are the most precious things this world of ours possesses. The world cries aloud for the best abilities of mankind to prevent our civilization from dissolving into chaos-because of the present disastrous state of the world.

Adams and Brown[4] lay great importance on social ability. They state, "With no group is it more important to develop fine ideals and attitudes than with the future leaders of our democracy. In a popular democracy, such as ours, socially accelerated individuals may, and frequently do, dominate."

1/ H. L. Cohen and N.G. Coryell, Educating Superior Students, American Book Co. 1935, p. 319.

2/ "Conference in Education for the Gifted" Auspices of Teachers College, Columbia, New York, Teachers College Record Feb.1941.

3/ R. Pintner, op. city. p. 407.

4/ F. Adams and W. Brown, Teaching the Bright Pupil. Henry Holt Co., New York, 1930.

Dr. Hollingworth[1] believes that the gifted children would have a good chance to improve their social intelligence if they had the opportunity to work closely with the class and to realize their responsibility to contribute knowledge to the class.

However, Witty and Wilkins[2] propose the acceleration method. They feel that this method devises desirable adjustment in all types of development, and it is desirable that the gifted child be typically above the average in physical development and general health. Whether these pupils are segregated or not, the selection of them and getting them at the top is important for social capillarity. In this way the dull and ineffectual will be deterred from taking key positions. This practice is done in justice to the progress and welfare of the State. It is evident that no government will advance, or last for any length of time, if it does not discover and educate those with higher mental powers.[3]

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[1] Leta Hollingworth, Gifted Children, Their Nature and Nurture, Macmillan Co., New York, 1926. p. 31

[2] Paul A. Witty and L. W. Wilkins, "Status of Acceleration or Grade Skipping as an Administrative Practice." p. 344. Educational Administration and Supervision, Vol. XIX, No. 5, May 1933.

[3] W. T. Russell "The Importance of Social Capillarity" Teachers College Record, Columbia University, New York, Vol. 42, Feb. 1941, p. 378.

Terman[1] made a study of approximately 1500 gifted children with an IQ above 130 to find what physical, mental, and personality traits are characteristic of intellectually superior children, and what sort of an adult a typical gifted child becomes. He studied this group over a period of twenty-five years. Some of his conclusions[2] confirm those of earlier studies, and some are in contradiction to conventional beliefs of laymen and educators.

1. In physique and general health, children of high IQ are on the average superior to the general child population.
2. The achievement quotients of gifted children in the pre-high-school grades average nearly as high as their IQ's; that, as a rule, achievement continues to be very superior in the high school, but that on entering college a good many subjects lose interest and make poor or mediocre records.
3. Versatility rather than one-sidedness is the rule with gifted children is demonstrated by the fact that their achievement quotients are usually high in all the school subjects.
4. The typical gifted child is customarily held to a grade location two or three years below the level to which normal mastery of the curriculum has already been attained, and that school retardation (defined as grade placement below achievement) is almost universal among the gifted.
5. Gifted children who have been promoted more rapidly than is customary are as a group equal or superior to gifted nonaccelerates in health and general adjustment, marry a little earlier, and are more successful in their later careers.
6. In character and personality, as evidenced both by tests and by trait ratings, gifted children average above the general child population, but that the degree of superiority is less marked for traits indicative of emotional stability and social adjustment than for intellectual and volitional traits.

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[1] Lewis M. Terman and Melita H. Oden, *The Gifted Child Grows Up*, Stanford University Press, Stanford, Cal., 1947, p. 2.

[2] *Ibid.*, p. 377.

7. Near mid-life such a group may be expected to show a normal or below-normal incidence of serious personality maladjustment, insanity, delinquency, alcoholism, and homosexuality.
8. As a rule those who as children tested above 170 IQ were more often accelerated in school, got better grades, and received more schooling than lower-testing members of the group; that they are not appreciably more prone to serious maladjustment; and that vocationally they are more successful.
9. The intellectual status of the average member of the group at the mean age of thirty years was close to the 98th or 99th percentile of the general adult population, and was far above the average level of ability of graduates from superior colleges and universities.
10. In vocational achievement the gifted group rates well above the average of college graduates, and as compared with the general population is represented in the higher professions by eight or nine times its proportionate share.
11. The vocational success of subjects all of whom as children tested in the top 1per cent of the child population is, as one would expect, greatly influenced by motivational factors and personality adjustment.
12. The incidence of marriage in the group to 1945 is above that for generality of college graduates of comparable age in the United States, and about equal to that in the general population.
13. Marital adjustment of the gifted, as measured by the marital happiness test, is equal or superior to that found in groups less highly selected for intelligence, and that the divorce rate is no higher than that of the generality of comparable age.
14. The offspring of gifted subjects show almost exactly the same degree of filial regression as is predicated by Galton's law.

In the field of science, the subject matter has been revolutionized so that the content is functional. In its original form, the course of study was concerned with subject mastery. Its ultimate aim was directed to the development of specialists in science rather than the education of the layman. The gradual change from this traditional system is taking form

in the belief that content is a means and not an end in itself. It should be a means of developing child growth in useful aspects.

The current trend in science education is to show its value as an integral part of life and the interaction of experience and theory. With this basic thought in mind, the major goal in a science program should fit the specific interests and needs of a specific group.[1]

Craig[2] states that a continuous science program should be developed in all schools. The material presented would differ with the mental maturity of the children. The introduction of science in the early grades and continuing on has many advantages:

1. It places emphasis on meanings rather than on objects.
2. It suggests learning elements at grade levels appropriate for that learning.
3. It provides for setting up new situations in later grades which may cause previous learning elements to be needed.
4. It provides for proper balance rather than a narrow segment which might result if the teacher followed her own interests and choices.

1/ E. P. True, "A Study of Some of the Values of Science in the Primary School" Unpublished Service Paper, Boston University, 1940.

2/ G. S. Craig, "A Program for Teaching Science", Thirty-first Yearbook of the National Society for the Study of Education, Part I. Bloomingdale, Ill., Public School Publishing Co., 1932, p. 158.

5. It gives the teacher guidance which comes from research and study.

Craig[1] advances these criteria as a means of judging the value of science content:

> Certain objectives that are selected for science in the elementary school should conform to those goals,- information, skills, and habits,- in science that are important because of their function in establishing health, economy, and safety in private and public life. Certain objectives that are selected for elementary science should conform to those facts,- principles, generalizations, and hypotheses- of science that are essential to the interpretation of the natural phenomena that commonly challenge children.

The objectives must be selected and evaluated in terms of their suitability for the elementary school. As Craig[2] says:

> It is quite likely that the lack of recognition of natural science in the elementary school has been due to the inanity of the activities proposed by our courses of study and by the lack of any challenge in the content that has characterized so much of our subject matter.

In the teaching of concepts in a science program, there is a natural order to be followed. Certain concepts are less involved and therefore require less previous learning. Furthermore, there are concepts that are prerequisites to the understanding of more involved ones. If these simple meanings precede the more difficult ones, the understanding of the degrees of difficulty helps in planning subject matter according to grade placement.[3]

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[1] G. S. Craig, op. cit. p. 143

[2] Ibid.

[3] Ibid., p. 145.

Since most of the everyday problems, in science, that challenge children have their origin in their homes and in the immediate community, it seems logical that excursions to these places be made. Almost any excursion may be made with any age group. Trips should be planned to supplement the pupils' experiences rather than to determine them.[1/]

As a teaching technique, an excursion is unique. It gives the child a first hand experience with materials that can not be brought into school. At one time the excursion was primarily for observation and identification. Very often this type of excursion excluded values related to the practices of focusing attention on the meanings of observations and identifications.[2/]

A science principle can not be "given" a child. He must derive these from his wide range of activities if they are to be meaningful to him. At this point, the teacher should help the child to integrate his new experiences with his past experiences. This power will help him to arrive at more inclusive understandings.[3/]

1/ Geo. Pitulga: "Science Excursions into the Community", Bureau of Publications, Teachers College, Columbia University, N. Y., 1943, p. 3.

2/ Ibid., p. 4.

3/ Ibid., p. 6.

The pragmatic philosophy of education is an important factor in bringing increased interest by using the environment to enrich the curriculum. John Dewey[1] states: "Human experience is unified and continuous, that knowing comes only through active experiencing, that meaning arises only through reaction". The pragmatic method tries to interpret each concept by training practical consequences.

Before starting out for the excursion, there should be discussion to clarify the objectives,- what the child wants to see, and what preparation he should make so that the trip will be more meaningful. Unless there is very active participation in the choice of the excursion, the children's interest may be indifferent or lacking altogether. It is important that the excursion be related to real problems so that the experience will be meaningful.[2]

"Generalizations of science are outcomes of wide ranges of activities which are recognized by the children as related and meaningful."[3]

1/ Ibid., p. 11.

2/ Geo. Pitulga, Ibid, p. 18.

3/ Ibid., p. 6

According to Craig[1] a science program may be developed using the following four types of activity:

I Discussion

This clarifies the problem. It helps to stimulate interest and to develop future trends toward more effective teaching.
Any information or misinformation which the child may have is discovered during this period.

II The Experiment

A problem becomes real and meaningful to the child by actually working with it.

III The Excursion

Observation of nature in the community such as the study of soil, rocks and the effect of the temperature changes becomes very valuable to instruction.

IV Reading

A child may educate himself by the reading of material of reliable information.

The material used in the workbook found in the appendix and described in Chapter III can be based on these four types of activity.

CHAPTER III

DESCRIPTION OF MATERIAL AND PLAN OF STUDY

CHAPTER III

Description of Material and Plan of Study

As previously stated the general aim of this study is to attempt to give concrete examples as suggestions of supplementary reading material for the intellectually gifted child in the third grade. Since science is an integral part of our everyday experiences, fundamental concepts of science should be developed as early as possible in the child's life.

The superior child has the ability to handle abstract ideas involving the higher mental processes; therefore the exercises set up in this study are an attempt to challenge this ability. Although the workbook was designed to be used as supplementary material without aid from the teacher, it could be used as a basis for the four types of activity previously mentioned, namely: discussion, experiment, excursion, and reading.

The purpose of the workbook is to give the children some information concerning the physical characteristics of goldfish, snails, and tadpoles; to describe their various stages of development; and outline the care required by these creatures.

Some conclusions based on science that might be drawn are:

Fish breathe with gills

Fish move through water by using their tails and fins

Water in the aquarium must have air

Some shails hatch from eggs, some are born alive

Snails help to keep an aquarium clean

Tadpoles change into toads, frogs, or salamanders.

Construction of the Workbook

The workbook is composed of thirty lessons with a comprehension check for each. The vocabulary used was checked against the words of third grade level from the Durrell "Primary Remedial Reading Vocabulary"[1] The words that did not appear on that list were extracted from the lessons. These words were listed according to lessons to be developed for pronunciation if necessary. Throughout the thirty lessons the first two types of comprehension are constant,- i. e. Yes - No and Essay.

The directions for the first type are:

I. Write Yes or No to these:

___ A. An aquarium is made of wood.

___ B. You can put more than one kind of sea creature together.

___ C. Water plants help to make a balanced aquarium.

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[1] Donald D. Durrell - Improvement of Basic Reading Abilities World Book Co., Yonkers-on-Hudson, New York, 1940, p. 345.

The directions for the second type are:

II. Write your answers to these in a few words.

A. Why is an aquarium made of glass?

B. What can people learn from these different kinds of sea animals living in one aquarium?

Another type of comprehension check is multiple choice. The sentence is completed with three answers, one of which is correct.

III. Draw a line under the best answer.

An aquarium has (muddy water, clear water, soapy water).

Another type of check is finding the major ideas in a selection.

IV. Check (/) the following answers if they tell about the story:

( ) A. Fishing
( ) B. Buying an aquarium
( ) C. Sea creatures
( ) D. How an aquarium is made

Another reading skill is following directions.

Draw a tank, according to the dimensions, so that it will hold one goldfish.

Another type of exercise is a dictionary lesson.

Words written in alphabetical order are in the same order as the alphabet.

They are written this way in a dictionary. This is the alphabet:-

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z.

Put the words below in alphabetical order by numbering them.

type______ body______ aquarium______
fantail______ short______ vision______
fringetail______ even______ lionhead______
protrude______

Word meanings are taken care of by finding synonyms and antonyms.

A synonym is a word that means the same as another word. In the story you will find synonyms of:

came------- at last-------
dot------- saved-------
mother)
father)------- set-------

Antonyms are words that have opposite meanings.

Find antonyms in the story of the words below:

after-------	under-------
small-------	rarely-------
thin-------	gather up-------

Some exercises are based on word analysis ability.

a,e,i,o,u are vowels. In story find words that have the short vowel sound of "a" and mark it this way: căt

There are exercises based on syllabication of words.

Long words are divided into parts called syllables. You will see a number after each word. That tells the number of syllables. Then write the words in syllables. Check with the dictionary.

picture (2) pic ture	goldfish (2)-------
common (2)-------	underside (3)-------
important (3)-------	folding (2)-------

There is also opportunity for the child to show his ability to evaluate material, express his ideas and organize them. The last lesson provides for this:

Did you like the stories about the aquarium? Which part did you like best?

Which didn't you like? How would you improve the parts you didn't like?

Write exactly what you think.

Description of the Material

In the first set of lessons the construction of the aquarium, its general care, and the anatomy of the goldfish are explained.

In the next group of lessons different types of water plants are discussed and illustrated.

The next series of lessons discusses the various types of snails.

The last series of lessons deals with the tadpole,- differences between the frog tadpole and the toad tadpole.

The material covered in the lessons was planned to include as many different types of water creatures as could be accomodated in one aquarium. Each creature is described in as much detail as the writer thought necessary for this type child on the third grade level. It was also planned that these lessons might teach some phases of good citizenship, such as: learning how to live peaceably with others, keeping our city clean, and good health habits. Thus, there is integration with other school subjects.

Many of the exercises call for creative thinking and the inferential type of question is used often enough to stimulate the higher processes of mental ability. The exercises are of varying length and each page is like a condensed chapter.

The directions at the beginning of each of the exercises are explicit enough so that the child can work independently.

Plan of the Study

The planning of this study involved the selection of a topic in natural science that might appeal to the interests of the intellectually gifted child in the third grade; reading of science material pertaining to goldfish, snails, tadpoles, and waterplants; rewriting this material in language that would appeal to and sustain the interest of the exceptionally bright child in the third grade; construction of a workbook consisting of thirty lessons with illustrations and using techniques common to those found in the fifth grade; selection of the population and arranging for administering the experiment.

Using Terman's classification the lowest limit of the "Very Superior" group, 120-140, was taken as a minimum score required for those children who were to participate in the experiment. In Community A, where the Kuhlman-Anderson Test[1] had been given the previous year, the upper decile of the

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[1] F. Kuhlman and Rose Anderson: Kuhlman-Anderson Tests Grade II. Philadelphia Educational Test Bureau, 1942.

scores was taken. This procedure was based on the premise that the Kuhlman-Anderson Test on the primary level is largely non-verbal and for that reason the scores might be lower than those obtained from the Revised Stanford-Binet Scale.[1/] Therefore the lowest limit of the Kuhlman-Anderson Test was 113 IQ.

Fifty-two pupils took part in the experiment,- twenty-six from Community A including eleven boys and fifteen girls from four classrooms; twenty-six from Community B including twelve boys and fourteen girls from eleven classrooms. Each day one page covering a phase of the science unit was given the children, followed immediately by a comprehension check. Both the selection and check were done silently by the children with no help from the teacher except for the pronunciation of words that did not occur on the "Durrell Primary Reading Vocabulary List."[2/]

A table based on the raw scores of the successes and failures of the various types of comprehension checks is included. There is another table showing the number of children, the mean chronological age, the mean mental age, the mean intelligence quotient and the sex. There is also a table included showing the number of boys and girls, range of C.A., range of M.A. and range of IQ.

1/ Lewis Terman and Maude A. Merrill: The Revised Stanford-Binet Scale. Houghton-Mifflin Co., Boston, Mass., 1937.

2/ Donald D. Durrell: op. cit.

Procedure

The writer met with the principals of the various schools in the communities in which the children were to participate in this experiment. The purpose and procedure to be used in the administering of the material were explained to them, and they accepted the material very willingly. It was also explained that these were not teaching lessons on the part of the teacher because word meanings were evident through context, and the directions on the comprehension sheet were self-explanatory.

Approximately fifteen minutes a day were allowed for the administering of the material. It was left to the discretion of the teacher as to whether she would integrate this unit into her regular teaching program or use it as supplementary reading material.

At the end of the week the lessons covered during that period were returned to the writer, and the results were checked and tabulated. This gave the writer a chance to evaluate the material in the light of the children's and teachers' reactions for part of the analysis of data.

The lessons incorporated into the workbook are included in the Appendix.

CHAPTER IV

ANALYSIS OF DATA

CHAPTER IV

Analysis of Data

The data obtained from this study were analyzed for these reasons:

1. To determine whether the techniques common to those found in grade five workbooks are suitable for the intellectually gifted child in the third grade.
2. To determine whether the exercises set up in this workbook are suitable for the exceptionally bright child in the third grade.

This analysis does not indicate or measure whether the child's interest was stimulated, whether he was motivated to further purposeful activity, whether his degree of enjoyment of the project was keen, whether he used his ability to critically evaluate or handle original composition well.

As shown in Table I the range of chronological ages is from 7-4 to 8-9. The range of mental ages is 8-11 to 11-6. The range of IQ is from 113 to 138.

As indicated in Table II the average chronological age is 8-1, the average mental age is 9-10, and the average intelligent quotient is 127 based on the Stanford-Binet Scale, Form L and 116.7 based on the Kuhlman-Anderson Test, Grade II.

Table III indicates the mean scores of the eight types of tests for each week for each sex.

Table IV indicates the type of lesson, the highest possible mean score for each type, and the mean score made by the pupils for each type

To take care of the element of guessing the formula R-W was used in scoring the following word analysis lessons:

Lesson 5 in the first week's series
Lesson 16 in the fourth week's series
Lesson 19 in the fourth week's series
Lesson 27 in the sixth week's series

In the exercises using multiple choice and the selection of major ideas, the following formula was used in scoring: $\frac{R-W}{2}$

The scoring in every other type of exercise was the number correct.

Drawing from Direction and Selection of Major Ideas were handled best. The Word Analysis exercises seemed to be least successful. The following types are listed from the most successful to the least successful according to the deviation of their mean scores from their highest possible mean scores:

Drawing from Directions
Selection of Major Ideas
Multiple Choice
True - False
Essay Type (Inferential)
Dictionary Type

Word Meaning

Word Analysis

All of the workbook exercises were completed by the group. There was a wide range of choice as to which part was most appealing. The exercises which required searching for details, as in the Word Analysis and identifying antonyms and synonyms, seemed to be uninteresting. It is doubtful whether the exercises on Word Analysis were of any value.

The exercises based on antonyms and synonyms would have been of greater value if the explanation of the terms was repeated more often. After the initial definition there was no further discussion of their meaning. As a result there was confusion between the meaning of antonym and synonym.

Some of the exercises which called for critical thinking, original composition and evaluation of material could not be measured objectively enough to appear in the table. The critical thinking, on the whole, was handled adequately, but the writer felt that the original composition and the sentence structure used in the evaluation exercise could have been of higher grade.

The weekly results on the various types of exercises listed in Table III show that the True-False exercises made gains the first three weeks. The fourth week regressed and the last week rated approximately the same as the initial score.

Drawing from Direction showed marked progress from the first week to the fourth week. The scores of the Selection of Major Ideas show great fluctuation with the sixth week totalling approximately the same as the first week. The Multiple-Choice, the Essay, and Word Meaning Exercises showed a slight gain from the first week to the sixth week. The Dictionary lesson showed a definite regression and the Word Analysis progressed to the third week and then regressed.

The writer observed that, as a whole, the scores of the fourth week were lower than those made the first week.

The comments received from teachers and pupils would indicate that the material was interesting and easily administered. In many cases the pupils anticipated the next day's lesson with enthusiasm and were anxious to share their newly gained knowledge with the rest of the class.

To quote one teacher who used the material:

"I think you will be interested to know that _______, _______, and _______ have brought in an aquarium and have three fish, a snail, and plants. _______'s mother is taking the children to the Aquarium next week. Interest is high and the children just eat this up. They work very independently and are at it each day before you can wink an eye."

Another teacher reported:

"A little boy in my room said that the material was helpful to him because he found a remedy to cure his goldfish. Until this time he couldn't find out what was wrong with his fish or how to treat it. The paper called "Taking Care of Sick Goldfish" furnished the information he was looking for."

This was written by another teacher:

"_______ enjoyed her papers every day. I know she gained much from her work. She contributed to science and reading classes those facts she felt were most interesting. Thus others shared her knowledge."

A newspaper clipping was sent to the writer by one of the children concerning the fish's sense of smell which was discussed in one of the lessons.

TABLE I

No.	Boys	Girls	Range of C.A.	Range of M.A.	Range of IQ
52	23	29	7-4 8-9	8-11 11-6	113-138

TABLE II

No. of Cases	Mean C. A.	Mean M.A.	Mean IQ	Sex	Intelligence Test
15	8-2	10-4	126	F	Binet - Form L
11	8-4	10-7	128	M	Binet - Form L
14	8-1	9-5	116.6	F	Kuhlman) Anderson)Gr. 2
12	7-8	9-0	116.8	M	Kuhlman) Anderson)Gr. 2
52	Av.8-1	Av. 9-10	Av.(127-Binet (116.7 K.A.		

TABLE III

Mean Scores for Each Week.

		1st week	2nd week	3rd week	4th week	5th week	6th week
Total No.	52	639	128	106	65	124	71
Boys	23	315	52	54	34	65	37
Girls	29	324	76	52	31	59	34

TABLE IV

Mean Scores for Each Type of Exercise

	1	2	3	4	5	6	7	8
Total No.	74	50	14	23	14	87	77	71
Mean Score	63	34	11	18	12	45	20	44

Code for Types of Exercises

1. True - False
2. Essay Type (inferential)
3. Selection of Major Ideas
4. Multiple Choice
5. Drawing from Directions
6. Word Meaning
7. Word Analysis
8. Dictionary Lesson

CHAPTER V

SUMMARY AND CONCLUSIONS

CHAPTER V

Summary and Conclusions

Although the analysis of data shows a great many failures, it must be kept in mind that just the skills could be measured. In this particular study it was impossible to indicate by way of analysis the interest that was aroused, the desire for further study on the part of the pupils, the various associated knowledges, the excursion to an aquarium taken by a group and the contributions made by the children to other members of the classroom.

The primary purpose of this experiment was to determine the value of the accompanying supplementary reading material based on a unit in science as a suggested means of meeting the needs of the exceptionally bright child in the third grade and as a suggested means of discovering their potential interests and talents.

An attempt has been made to show through a review of research that there is a lack of material for the intellectual child. There was also an attempt to show that science need not be an isolated subject but can be integrated with other school subjects. The workbook, as seen in the Appendix, is a suggested means of overcoming this shortage of material using science as a basis with reading, art, language arts, principles of good citizenship, and laws of good health integrated within the unit.

A series of thirty lessons was constructed with a comprehension check for each lesson in the form of a workbook. These comprehension checks were devised on the bases of techniques common to those found in the fifth grade.

Fifty-two children were chosen to participate in the experiment. There were twenty-nine girls and twenty-three boys from fifteen classrooms in ten schools distributed between two suburban towns. The mean chronological age was 8-1; the mean mental age was 9-10; the mean intelligence quotient (Stanford-Binet Scale) was 127 and 116.7 (Kuhlman-Anderson Tests Grade II).

The lessons were given to the pupils on thirty consecutive school days for approximately fifteen minutes a day. This time was not taken from their regular program since the material was supplementary work to be done independent of teacher instruction. However, it could very easily be used as a basis for the four types of activity previously mentioned, namely: discussion, experiment, excursion, and reading.

The general aim of this workbook was to show through stories, illustrations, and exercises the influence of environment upon living creatures and the relationship of one living creature to another in the same surroundings.

The specific aim of the workbook was the retention of some content items to be used as a basis for discussion in other

school subjects.

It was hoped that as a result of using this workbook, interest in the field of science would be stimulated to such a degree that the pupils would be motivated to further reading.

Through analysis of data the following results were shown:

Selection of Major Ideas and Drawing from Directions were handled best. The most unsuccessful type was the Word Analysis. The following types are listed from the most successful to the least successful:

Drawing from Directions
Selection of Major Ideas
Multiple Choice
True-False
Essay Type (Inferential)
Dictionary Lesson
Word Meaning
Word Analysis

CHAPTER VI

LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

CHAPTER VI

Limitations of the Study and Suggestions for Further Research

As shown in the Analysis of Data the workbook has many inadequacies. These may be due to the following limitations:

A much larger population might have been used.

A prerequisite of the training in fifth grade study skills might have resulted in higher scores.

In many cases the format of the multiple choice statements did not conform with that to which the children were accustomed, and as a result there was confusion in finding the correct answer.

The explanation of synonyms and antonyms did not recur after the original introduction of the term. The children forgot the meanings of these two terms when needed for subsequent lessons.

It was evident that the method used in the word analysis exercise was not successful.

In the lesson on the construction of the aquarium a third dimension is given which proved too difficult.

Some of the inferential type of questions were too difficult.

The writer feels that if it were possible for the children to see their corrected papers, more of them would have been motivated to do more accurate work. It is also felt that this type of material would be very effective if it were integrated into the regular school program and not treated as an isolated project.

Although some of the children participating in the experiment did not enjoy the particular topic, the evaluation of the material by the children indicated that many of them had a keen interest and a desire for more material.

Many teachers expressed their gratitude for the material as a means of satisfying individual differences in the classroom and felt that the children had gained much factual knowledge from the study.

The following may be used as suggestions fur further study:

1. Exercises to develop study skills for the intellectually gifted in the third grade
2. The study of the metamorphosis of the frog from the egg to the full grown adult
3. A unit based on science to be used as a regular part of the classroom program using discussion, experiment, excursion and reading

4. A survey of the areas in natural science that are of interest to the exceptional child in the third grade
5. As a result of suggestion No. 4 a unit based on the preference voted by the majority
6. Gains made under teacher direction in a particular unit of science as compared with those made by the children working independent of teacher guidance.

BIBLIOGRAPHY

SUPPLEMENTARY READING MATERIAL BASED ON A SCIENCE UNIT IN THE THIRD GRADE FOR THE GIFTED CHILD

Adams, P., and W. Brown: TEACHING THE BRIGHT PUPIL
Henry Holt & Co., N.Y.1930, 249 pp.

Carroll, H. A.: GENIUS IN THE MAKING, N. Y.
McGraw-Hill Book Co.,1940,307 pp.

Cohen, H. L., and Nancy Coryell: EDUCATING SUPERIOR STUDENTS, N.Y.
American Book Co., 1935

Dransfield, J. Edgar: ADMINISTRATION OF ENRICHMENT TO SUPERIOR CHILDREN IN THE TYPICAL CLASSROOM
Contribution to Education #558
Bureau of Publications T. C.

Durrell, Donald D.: IMPROVEMENT OF BASIC READING ABILITIES
World Book Co., 1940

Goddard, Henry H.: SCHOOL TRAINING OF GIFTED CHILDREN
Yonkers-on-Hudson, N.Y.
World Book Co., 1928

Gray, Will S.: EDUCATION OF GIFTED CHILDREN: WITH SPECIAL REFERENCE TO READING
Elementary School Journal 42: 736-44, Jo. '42

Groszmann, M.P.E.: EXCEPTIONAL CHILD
Chas. Scribner's Sons, 1917

Hatch, Mabel T.: STUDY OF THE RESEARCH DONE ON THE GIFTED CHILD FOR THE PAST THREE DECADES
Unpublished Service Paper,
Boston University, 1944

Hollingworth, Leta S.	GIFTED CHILDREN, THE NATURE & NURTURE, N. Y. Macmillan Co., 1926, 374 pp.
	CHILDREN ABOVE 180 IQ N.Y. Macmillan Co. 1940, 332 pp.
	GIFTED CHILDREN OF NEW YORK Macmillan Co., 1926
Johnson, C. F.:	GIFTED PRIMARY CHILDREN Educational Methods 10: 456-8, May '31
Lane, F. K.:	EDUCATION OF GIFTED PUPILS IN SECONDARY SCHOOL OF LOS ANGELES Journal of Educational Sociology Oct. '39, p. 101
Martens, Elise H.:	TEACHER PROBLEMS WITH EXCEPTIONAL CHILDREN-GIFTED CHILDREN U.S. Office of Education, Pamphlet 41, 1940
Osburn, W. J. & B. J. Rohan.:	ENRICHING THE CURRICULUM FOR GIFTED CHILDREN N. Y. Macmillan Co. 1931, 408 pp.
Pintner, R.:	SUPERIOR ABILITY Teacher's College Record, Feb. '41 Vol. 42, pp. 407-19
Russell, W. T.:	IMPORTANCE OF SOCIAL CAPILLARITY Teacher's College Record, Vol. 42, Feb. '41, p. 378
Sullivan, J. C.:	ADEQUATE EDUCATION FOR THE INTELLECTUALLY SUPERIOR CHILD Journal of the Exceptional Child, Nov. '46
Teachers College Record:	CONFERENCE IN EDUCATION FOR THE GIFTED Auspices of Teachers College, Columbia, N. Y. Teachers College Record, 1941

Terman, L. M.: THE GENETIC STUDIES IN GENIUS
Vol. I, Vol. II, Stanford University Press, Stanford, Cal., 1936, 648 pp.

THE GIFTED STUDENT & HIS ACADEMIC ENVIRONMENT
School & Society, Vol. 49, p. 65,1939

Terman, Lewis M. & Melita H. Oden: THE GIFTED CHILD GROWS UP
Stanford University Press, Stanford, Cal., 1947

Thorndike, R. L.: PROBLEMS IN IDENTIFICATION, DESCRIPTION AND DEVELOPMENT OF THE GIFTED
Teachers College Record, Vol. 42, p. 402-406, Feb. '41

Witty, Paul A., & L.W. Wilkins: STATUS OF ACCELERATION OR GRADE SKIPPING, AS AN ADMINISTRATIVE PRACTICE
Educational Administration and Supervision, Vol. XIX, No. 5, May, 1933

Boston University
School of Education
Library

BIBLIOGRAPHY OF TESTS

Kuhlman, F., & Rose Anderson:	Kuhlman-Anderson Tests, Grade II, Philadelphia Educational Test Bureau, 1942
Terman, Lewis & Maud A. Merrill:	The Revised Stanford-Binet Scale, Houghton-Mifflin Co., Boston, Mass., 1937

BIBLIOGRAPHY OF SCIENCE REFERENCES

Craig, Gerald S., Science for the Elementary School Teacher, Ginn & Co., Boston, 1940

"A Program for Teaching Science" - 31st Yearbook of the National Society for the Study of Education, Part I, Bloomingdale, Ill., Public School Publishing Co., 1932

Pitulga, George, "Science Excursions into the Community", Bureau of Publications, Teachers College, Columbia University, New York, 1943

True, Elizabeth P., A Study of Some of the Values of Science in the Primary School, Unpublished Service Paper, Boston University, 1940

BIBLIOGRAPHY OF WATER CREATURES FOR THE TEACHER

Bronson, Wilfred S. "Polliwiggle's Progress" Macmillan Co. N. Y., 1943

"Fingerfins, Tale of a Sargasso Fish", Macmillan, 1930

Compton, F. E. Co., Compton's Pictured Encyclopedia, 1946

Garrison, Science Experiences for Little Children, p. 21-27 Scribner, 1939

Innes, William T. "The Complete Aquarium Book", Rowe, Peterson Co.

Kearney, Paul W., "Strange Fishes", Doubleday, Doran & Co., Inc., Garden City, N. Y., 1933

Mellem, Ida M. "Young Folk's Book of Fishes", Dodd, Mead, N.Y., 1937

"Twenty Little Fishes", Junior Literary Guild and Julian Messner Inc., N. Y., 1942

Morgan, Alfred P. "An Aquarium for Boys and Girls", Scribner's

Parker, Bertha Morris, "Fishes", Rowe, Peterson

BIBLIOGRAPHY FOR CHILDREN

Assoc. for Childhood Education, "Told Under The Magic Umbrella, p. 154-164, Macmillan, 1933

Beauchamp, Wilbur L. Science Stories III "Water Animals" Scott Foresman, 1936, p. 28-47

Blough, Glenn O., "An Aquarium", Rowe, Peterson & Co., 1943

Bronson, Wilfred S., "Fingerfins, Tale of a Sargasso Fish", Macmillan Co., N. Y. 1930

Polliwiggle's Progress" , Macmillan Co., N. Y., 1943

Brown, Ethel C. "The Green Gate to the Sea", Silver, Burdett

Buckingham, B. R., Munching Peter, "Our Friend the Toad", Ginn & Co., Boston, 1934

Craig & Baldwin, "Changes All Around Us", p. 251, Ginn & Co., 1940

Craig, G. S., and Agnes Burke, "We Find Out", p. 13-14, Ginn & Co., 1940

Daglish, Eric Fitch, Fishes and Sea Animals, "Animals in Black and White", Vol. 6, Morrow

Dopp, Pitts, and Garrison, "Outdoors and In", p. 1935, Rand McNally & Co., 1935.

Flack, Marjorie, "Tim Tadpole and the Great Bullfrog", Doubleday Doran & Co., Inc., N. Y., 1941

Frasier, Dolman, Van Noy, Through the Year, "Wake Up", p. 112, L. W. Singer Co., Chicago, Ill., 1937

"Winter Comes and Goes", p. 146, 29-35, L. W. Singer, Chicago, Ill. 1938

"Seasons Pass", p. 48-52, 61-63, L. W. Singer, 1938

Gates, A. I., "Wide Wings", p. 191-195, Macmillan, 1939

"Brownie and His Friends", p. 11-48, Good Companion Books, Macmillan & Co., 1940

Knox, Stone, Meister & Noble Wonderworld of Science II, Chas. Scribner, 1946, "How Frogs Grow"

Wonderworld of Science IV, Chas. Scribner, 1946, "Balancing the Aquarium", p. 185, "Life in Ponds, Lakes and Oceans", p. 191, "Strong Companions", p. 194

Masters, "Pet Club" Our Animal Book, p. 28-39, D.C. Heath 1937

Parker, Bertha M., "Fishes", Rowe, Peterson Co., 1941

Patch & Howe, Nature and Science Readers, p. 75, Macmillan Co., 1935

Storm, Grace E., "Friends About Us", p. 33-36, 48-50, Guidance in Reading Series; Lyons & Carnahan

Studebaker, John W., Number Stories II, p. 46-49, Scott, Foresman, 1942

APPENDIX

The Following Lessons Constitute the Workbook.

Directions for Teachers.

This study is for the intellectually gifted child with an IQ between 120 and 140. The purpose of it is to ascertain whether or not the exercises contained in it challenge the mental capacities of those children, and if these exercises stimulate the children's interests to further study.

Please, ask the children to write their names on the backs of their papers.

It would be appreciated if you would list the names of the children, who use this material, with their respective IQ's.

Any suggestions that you may have, and would care to give, concerning the improvement of these exercises would, also, be appreciated.

Directions for Teacher.

[illegible] study is not the intellectually
[illegible] will no[illegible] between [illegible] and the
child blind
The purpose of it is to ascertain whether
or not the exercises contained in it clearly
the mental capacities of these children and
if these exercises stimulate the children's
interests to further study

Please, ask the children to write their
names on the backs of their papers.
It would be appreciated if you would list
the names of the children who use this
material, with their respective IQ's

Any suggestions that you may have and
would care to give, concerning the nature
or use of these exercises would also be
appreciated.

The vocabulary listed below with lesson numbers, may have to be developed with the children. Please check(✓) those that do have to be developed.

1
container Usually
water creatures
aquarium balanced

2
Constructing necessary
Antonyms ordinarily
dimensions

5
synonyms vowels

6
varieties

7
fringetail telescope
vision protrude
veiltale dictionary
alphabetical

8
magnifying growth

9
streamlined dangerous

10
oxygen vibrations

11
syllables

12
entertaining amusing
biscuit Naturally
paragraph

14
cleanliness

15
occasionally siphon
disturbing degrees
removing temperature
entirely

16
neglected solution remedy

17
resolution

18
Arrowhead Milfoil
Wild Celery Cabomba
Waterweed

19
supply prevents
nitrogen carbon dioxide

20
companions tropical
combining Red Ramshorn
Australian Red
Potomac good-natured

23

radula antennae
objects distances

24

extends anchors muscles
conditions
muscular development

25

salamander amphibians
continuously absorbed
metamorphosis

26

formation protective
adult

27

explain exactly

28

impatient totally
eyesight

29

purpose feathery
gracefully Worse
resemble skillfully

30

stomach cannibal
vital improve

23

radiate [illegible]
objects distances

24

extends [illegible] muscles
condition
muscular development

25

salamander amphibians
continuously absorbed
metamorphosis

[illegible]

formation protective
adult

[illegible]

[illegible] exactly

[illegible]

impa[illegible] [illegible]lly
e[illegible]

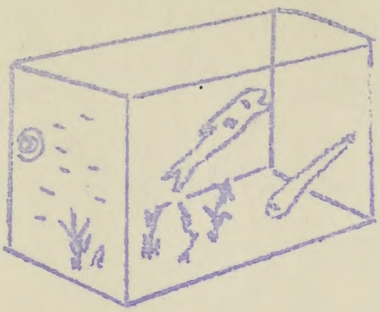
[illegible]

purposes feathers
gracefully [illegible]
resemble skillfully

[illegible]

stomach [illegible]
vital [illegible]

An Aquarium



Did you ever see goldfish, snails, and tadpoles all together in a large container? Of course, you did! Do you know what this container with these water creatures is called? It is called an aquarium. The aquarium has bottom and sides of glass. Usually, the bottom is covered with sand, and water plants grow in the sand. If the aquarium has plants and water animals, we call it a balanced aquarium.

You may have different kinds of water animals live together. These may be three small goldfish, six big snails, and one wiggly tadpole. These animals are all different, and yet they can all get along in one aquarium.

An Aquarium

Did you ever see goldfish, snails
and tadpoles all together in a large
[illegible]? Of course you did. Do you
[illegible] what this container with
[illegible] creatures is called? It is called
an aquarium. The aquarium has a bottom
and sides of glass. Usually the
[illegible] is covered with sand and [illegible]
grow in the sand. If the aquarium
[illegible] and other animals, we call
[illegible] a balanced aquarium.

[illegible] may have different
[illegible] snails live together
[illegible] three small [illegible]
[illegible] and one [illegible]
a

I. Write Yes or No to these:

___ A. An aquarium is made of wood.

___ B. You can put more than one kind of sea creature together.

___ C. Water plants help to make a balanced aquarium.

II. Write your answers to these in a few words:

A. Why is an aquarium made of glass? ____________________

____

B. What can people learn from these different kinds of sea animals living in one aquarium?

____

III. Check (✓) the following answers if they tell about the story:

( ) A. Fishing
( ) B. Buying an aquarium
( ) C. Sea Creatures.
( ) D. How an aquarium is made

IV Draw a line under the best answer.

A. An aquarium has (muddy, clear, soapy) water.

B. Sea animals that may live together are: (tropical fish and goldfish; snails and goldfish; tadpoles, tropical fish and goldfish).

[illegible]

[illegible] [illegible]

2. Write your answers in
a few words!

4. Why is an aquarium made of
glass? ________________

[illegible] can people [illegible]
there [illegible]

[illegible]

6. [illegible]

[illegible]

Constructing an Aquarium

It is a good idea to get your tank, sand and water plants about two days before you get the fish. Put the sand in a large pot and let water run through it until every bit of clay and soil are washed away.

When you are sure that the sand is clean, spread it an inch thick over the bottom of the tank. Next, fill the tank about a quarter full of water. Then make a little hole with your finger and place the roots of the water plants into the sand. These plants will be very helpful to the goldfish.

Usually, a gallon of water is allowed for every inch of goldfish, without counting the tail. A tank is never filled to the very top. It is necessary for the top of the tank to be big so that the fish can get air.

Common tank sizes are:

Size of tank	Depth	Number of fish
2 gallons; 6"x10"	7"	1
3 gallons; 6½"x12"	8"	2
4 gallons; 7½"x14"	9"	3
6 gallons; 8½x16½"	10"	5-6

I. Write Yes or No to these:

__A. The tank is made ready a few days before you get the fish.

__B. Clay is spread an inch thick over the bottom of the tank.

__C. A gallon of water is needed for every inch of fish, counting the tail.

II. Write the answers to these in a few words:

A. Why is the tank never filled to the very top? ________________

____

B. How do you get rid of clay and soil from the sand? ____________

____

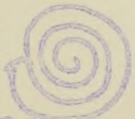
III. Draw a tank, according to the dimensions, so that it will hold one goldfish. Use another piece of paper.

IV Antonyms are words that have opposite meanings. Find antonyms in the story of the words below:

after________	under________
small________	gather up______
thin________	

Can You Draw My Picture?

I am Sammy Goldfish. I have round eyes that never shut and a tail that spreads in two parts. I live in Aquarium Lane, but I was so lonesome that I asked Willie Tadpole to be my neighbor. He darts in and out of the water plants. You really can't tell where his body begins and where his head stops. He has a long tail that helps him swim fast.

We like to keep our street clean, just as you do, so we invited Charlie Snail to be our neighbor. And is he clean! He chews up every speck of The plants that floats on top of the water or that sticks to the sides of the aquarium. Charlie doesn't have to worry about a house because he takes his own on his back wherever he goes. It is made of a hard shell that looks like this: 

On another piece of paper draw me in my aquarium with my two friends.

Goldfish-1-

There are many kinds of fish that you could have in an aquarium, but the most popular kind is the goldfish More goldfish are kept as pets than either dogs or cats.

The Chinese and Japanese have kept goldfish for hundreds of years. An American sailor brought some home from Japan about seventy years ago, and since that time we see them everywhere.

Goldfish look very much like the carp which are a common fish. A young carp and a young goldfish have the same brownish color The difference between them is that the wild carp grows much larger than the goldfish and turns black instead of gold

Fishermen catch carp and sell them as food. Since goldfish are carp, they could be eaten. Would you like to eat goldfish? Why?

Goldfish

There are many kinds of fish that we keep in an aquarium but the most popular is the goldfish. [illegible] them with [illegible]

The Chinese and Japanese have kept goldfish for hundreds of years. An American sailor brought some home from Japan seventy years ago and since that time we see them everywhere.

Goldfish look very much like the carp which are a common fish. A young carp and a young goldfish have the same coloring. The difference is when they grow up the carp grows much [illegible]

[illegible] and since gold [illegible] when would you like [illegible]

I. Write Yes or No to these:

__A. Goldfish are the only kind of fish for an aquarium.

__B. The first goldfish came to America from Holland.

__C. the only difference between a full-grown carp and a full-grown goldfish is its color.

II. Write your answers to these in a few words:

A. In which ways are goldfish and carp alike, and in which ways are they different?

------------------------

------------------------

B. How did goldfish find their way to America?

------------------------

III. Find, in the story, antonyms of the words below:

few----------- tame-------

nowhere---------- buy-------

rare------------ smaller------

IV. Draw a line under the best answer:

A. More goldfish are used as pets than (cats and chickens) (ponies and dogs) (cats and dogs).

B. The carp and goldfish belong to the same (club, swimming club, family).

Goldfish-2-

Many. many years ago, the goldfish did not look as they do today. Before they arrived in America, the goldfish were only carp with a speck of gold on their sides. We think some Chinese boy must have caught some carp and put them in a bowl. Soon they laid eggs. When these eggs were hatched, some of the young fish had more of the gold color than their parents. These were kept aside, and then from their babies, the more golden ones were kept. Finally, after many years, the pure gold color fish was born.

In the same way, the goldfish with black or white spots were found. Their young were kept, and now, after many years, there are many kinds of goldfish. Some goldfish are not gold, at all, but are pure black.

Other kinds have spots of black, silver, gold, purple, and brown.

Goldfish

ny many years ago, the

ned ly today. Before

goldfish were only col

on their sides. We th

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ny years, the pure gold c

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t were golds were ed

fter many yea

goldfish. Some goldfish ar

are o blaze

when the heda

I. Write Yes or No to these:

-- A. The goldfish has always looked as he does now.

__B. Some goldfish have colored spots.

__C. It is not true that a goldfish can be black.

II. Write your answers to these in a few words:

A. Do you think it was a good idea to breed different color goldfish? Why?

- -

B. If you wanted all the fish to have fan-shaped tails, how would you do it?

- -

III Words that mean the same are called synonyms. In the story, you will find synonyms for:

came - - - - - - - -   At last - - - - - - - -

dot - - - - - - - - -   saved - - - - - - - -

{mother father} - - - - - - -   set - - - - - - - - -

IV a, e, i, o, u are vowels. In the story, find words that have the short vowel sound of "a" and mark it this way:

căt

I Write Yes or No to these.

— A The goldfish has always looked as he does now.

— B Some goldfish have colored spots.

— C It is not true that a goldfish be black.

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A Do you think it was a good idea to breed different color goldfish? Why?

____

B If you wanted all the fish to have fan-shaped tails, how would you do it

____

III Words that mean the same are called synonyms. In the story you will find synonyms for:

came ------- At last -------

cut ------- saved -------

{mother / father} ------- set -------

IV [illegible]

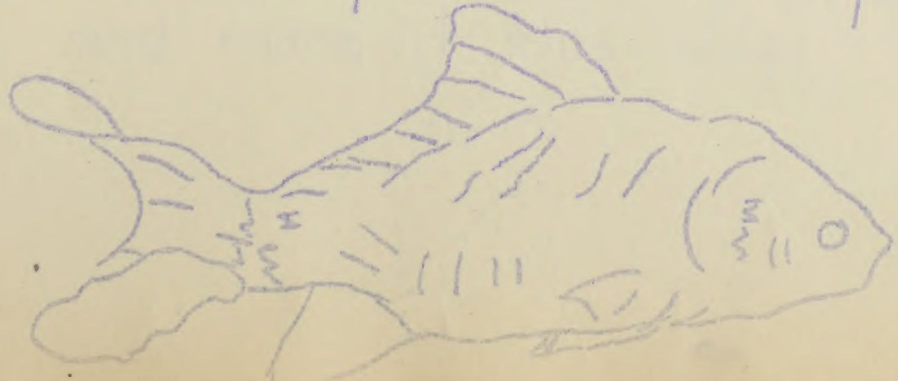
words that [illegible]

Goldfish-3

Just as we have different breeds of cats, dogs horses, and cows so we have varieties of goldfish. There is the long tail or pop-eye type. At times you'll find some whose heads seem too large for their bodies.

Of all the varieties of goldfish, the most common type has the long body, small head, and forked tail. In fact, it looks like Sammy Goldfish. Its color varies very much. It may be all gold or it may have patches of silver or black. This common type is strong and easy to take care of. Would this type make a good pet? Why do you think so?

If this goldfish is kept in a pond with plenty of food, it will grow to be a foot long. Would that be a good size for an aquarium in your home? Why?



Goldfish-3

Just as we have different breeds of cats, dogs, horses, and cows so we have varieties of goldfish. There is the long tail or pop-eye type. At times you'll find some whose heads seem too large for their bodies.

Of all the varieties of goldfish, the most common type has the long body, small head and forked tail. In fact, it looks like Sammy Goldfish. Its color varies very much. It may be all gold or it may have patches of silver or black. This common type is strong and easy to take care of. Would this type make a good pet? Why do you think so?

If this goldfish is kept in a pond with plenty of food, it will grow to be a foot long. Would that be a good size for an aquarium in your home? Why?

I. Write Yes or No to these:

__ A. There is only one variety of goldfish.

__ B. The most common type has a long body, small head, and fan tail.

__ C. The strong type of goldfish is the common type.

II. Write your answers to these in a few words:

A. Why is the strong type the common type?

------------------------

B. How did we get different varieties of goldfish?

------------------------

------------------------

III. Find, in the story, antonyms of:

same__________ weak __________
lose__________ shortage__________
least__________ none __________

IV. In the story find the words that have the short vowel sound of "i" and mark it this way:

$h\breve{i}m$

Goldfish -4-

Types

The first type of goldfish is the fantail. Its body is round and wide with a spreading tail almost as long as its body. The next type is the fringetail. Its tail is even longer and finer than that of the fantail. Sometimes the tail is twice as long as the fish.

The telescope goldfish has eyes that protrude from its head but it hasn't good vision. At times it bumps against the glass of the aquarium and gets hurt. Why do you think this happens?

The lionhead has a large head that looks like a lion's head. Since its eyes are small and its body short, the bumpy head seems larger.

Fantails, lionheads, and telescopes may be all gold or spotted.

Goldfish -4-

Types

The first type of goldfish is the fan-tail. Its body is round and wide with a spreading tail almost as long as its body.

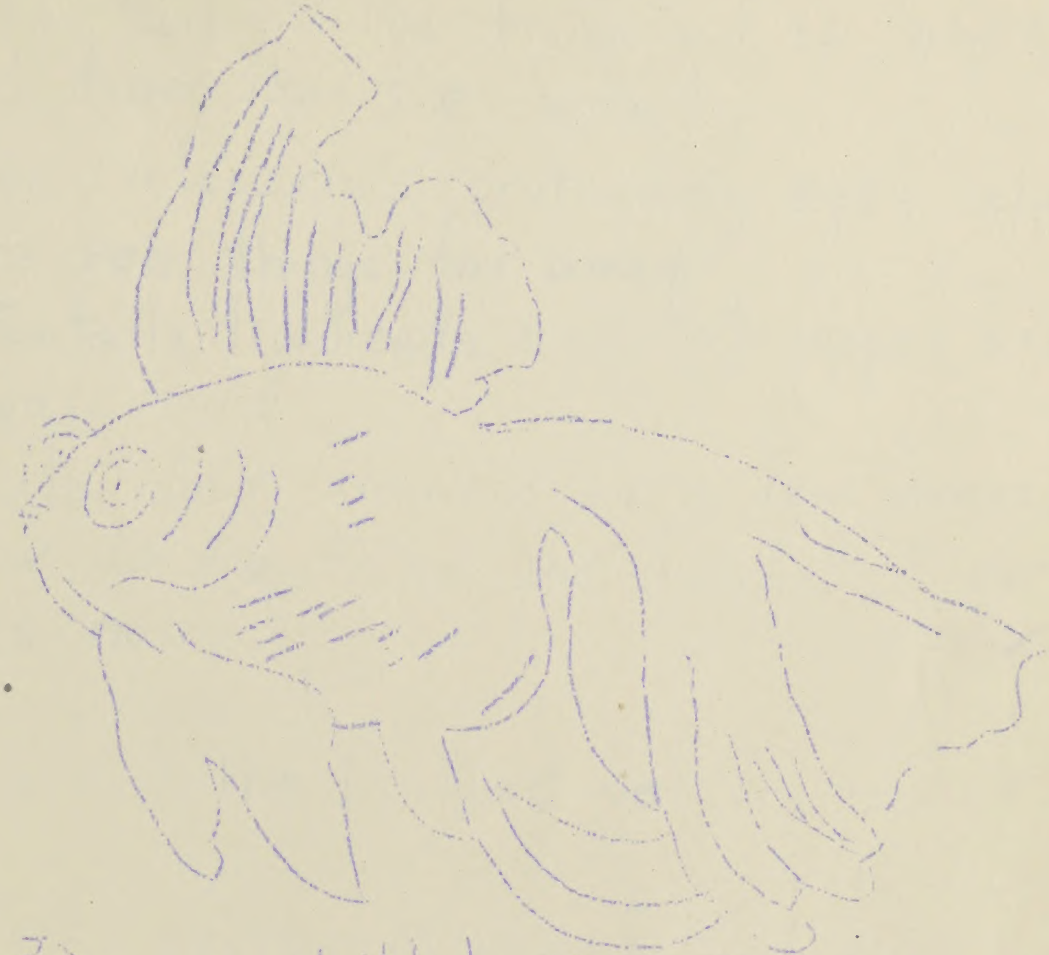
The next type is the fringetail. Its tail is even longer and finer than that of the fantail. Sometimes the tail is twice as long as the fish.

The telescope goldfish has eyes that protrude from its head but it hasn't good vision. At times it bumps against the glass of the aquarium and gets hurt. Why do you think this happens?

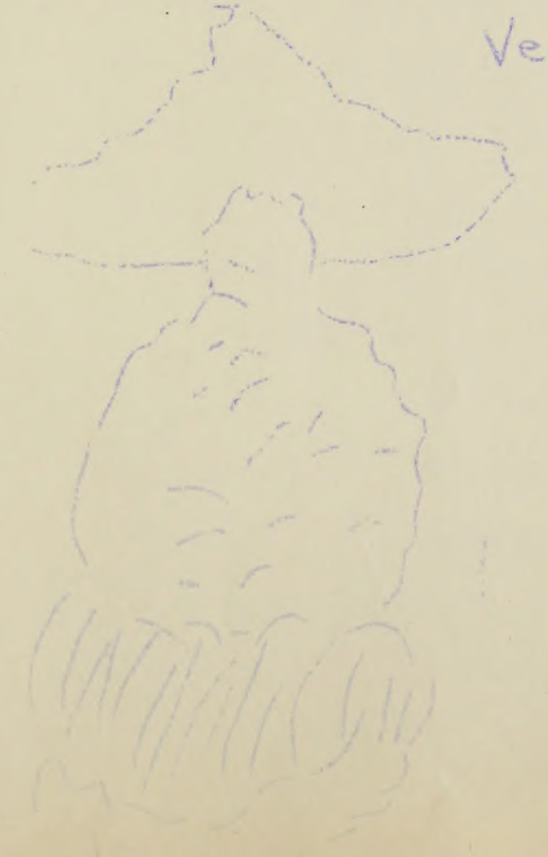
The lionhead has a large head that looks like a lion's head. Since its eyes are small and its body smaller its bumpy head seems larger.

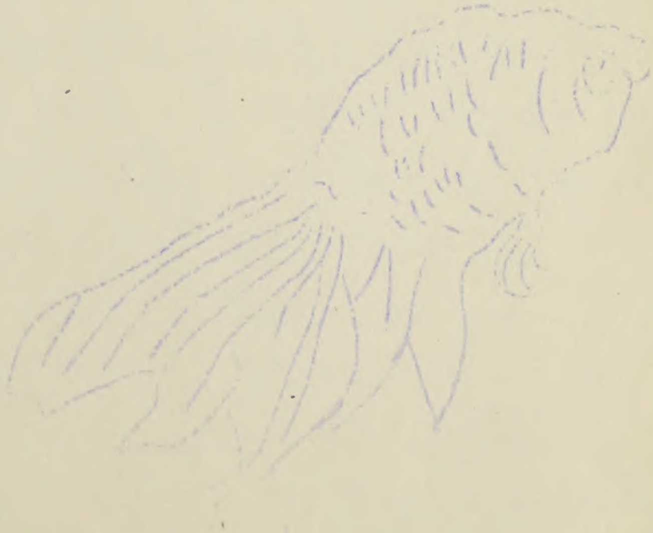
Fantails, lionheads and telescopes may be all gold or spotted.

Pictures of Some Types.



Veiltale Moor Telescope





Fantail

Lionhead

I. Write Yes or No to these:

—— A. The tail of the fringetail is longer and finer than the fantail.

—— B. The telescope's protruding eyes help him see things far away.

—— C. Fantails, lionheads, and telescopes are always gold.

II. Write your answers in a few words:

A. How do you think the fringetail got its name?

— — — — — — — — — — — — — — — — — — —

B. How did the lionhead get its name?

— — — — — — — — — — — — — — — — — — —

III. Words written in alphabetical order are in the same order as the alphabet. They are written this way in a dictionary. This is the alphabet: — a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z. Put the words below in alphabetical order by numbering them.

types — fringetail — protrude —
vision — even — lionhead —
body — aquarium — short —

IV. On another sheet of paper draw three types of goldfish and write the correct names under their pictures.

[illegible]

A [illegible] tain [illegible]

and fruit [illegible] apple

b [illegible] the [illegible]

from [illegible] far away

Think is [illegible] land [illegible] are

a wa [illegible]

[illegible]

the [illegible]

Goldfish -5-

Scales

Did you ever notice the body of a fish? It doesn't look like our skin or an animal's hide. It looks like squares marked off. These are called scales. Like other fish, the goldfish is covered with scales. You may also say that scales look like shingles on a roof. These scales grow out of the fish's skin just as you hair grows out of your skin. The scales grow as the fish grows. As each year passes, a ring is formed on each scale. In this way, you can tell the age of the fish. If you go to the fish store and get some fish scales, you can see the rings on them with a magnifying glass.

Don't pull a scale out of your goldfish!

I. Write Yes or No to these:

___ A. Scales look like shingles on a roof.

___ B. The scales reach their full growth at birth.

___ C. A dot on each scale tells the fish's age.

II. Write your answers in a few words:

A. How can you tell a fish's age?

____

B. Why do you have to use a magnifying glass to see the rings?

____

III. If you know words are in the first half of the dictionary, you will save time when you look for them. Words from a through m are in the first half. Those from n through z are in the last half. After each of the words below write first or last to show which half of the dictionary they are in.

ever ------
notice ------
body ------
magnifying ------
doesn't ------
squares ------
marked ------
glass ------
shingles ------
grow ------
formed ------
pull ------

Goldfish - 6 -
Built for Action

Did you ever see a streamlined automobile or a streamlined train? Why are they made that way?

The common goldfish has a streamlined body and for this reason, they can swim faster than the fancy goldfish with round bodies. This would be very dangerous to the fancy goldfish if they were in a pond. Why?

Did you know that a goldfish has a nose? Well, it has! Just above the mouth are two tiny holes. This is his nose, but he doesn't use it to breathe with as we do. He uses it to smell. why would a goldfish have to smell?

I. Write Yes or No to these:

___A. Streamlining makes for more speed.

___B. The fancy goldfish can't swim fast.

___C. The goldfish's nose helps him get fresh air.

II. Write your answer in a few words.

A. Why is the common goldfish a fast swimmer? _

B. How is the fish's nose useful to him?

_ _

III. Check (✓) the following answers if they tell about the story.

( ) A. Trains

( ) B. The common goldfish

( ) C. How a fish smells

( ) D. How a fish breathes

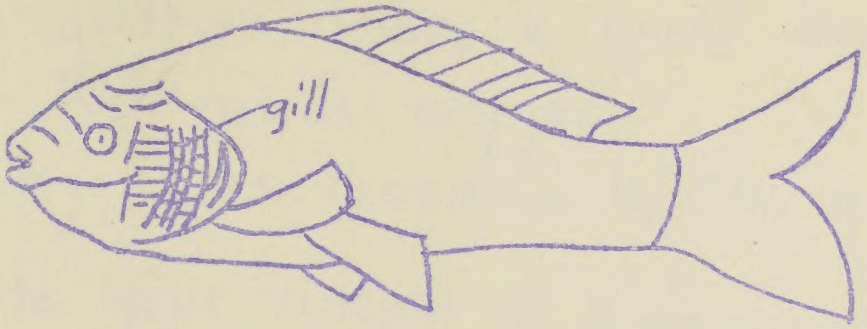
IV. Draw a line under the best answer:

A. The common goldfish has a (thin body, a streamlined body, a round body).

B. The nose is just above the (ears, eyes, mouth).

C. A goldfish uses his nose to (sneeze, breathe, smell).

How a Fish Lives



Did you ever notice a goldfish open and shut its mouth all the time? No, it's not drinking water. It is breathing. A fish can not live without oxygen, and oxygen is found in water. He doesn't use his nose to breathe, as we do. He sucks in water through his mouth, but he doesn't swallow it. There are two flaps on either side of his head through which the water passes. Beneath these flaps are the gills which are bright red. These gills take the oxygen from the water, as it passes out of the fish's body.

A fish has teeth and ears, too! He needs ears for balance, although he hears low tones and feels vibrations. He, also, feels the push of water through tiny holes, in a line, along the sides of his body.

Do you know that a fish stares because it has no eyelids to close its eyes? Although the goldfish can see, it has poor vision. It doesn't see well because the lens, which takes in light, is round instead of flat.

I. Write Yes or No to these:

— A. A goldfish drinks a great deal of water.

— B. A fish needs oxygen.

— C. Oxygen is taken in by the gills.

II. Write your answer in a few words:

A. Why does a fish need ears? ----------

B. Why isn't the fish's eyesight good?

III. Check (✓) the following answers if they tell about the story:

A. The food fish eat.

B. Catching fancy goldfish.

C. How a fish breathes.

D. Why a fish doesn't see well.

IV. Find synonyms in the story for:

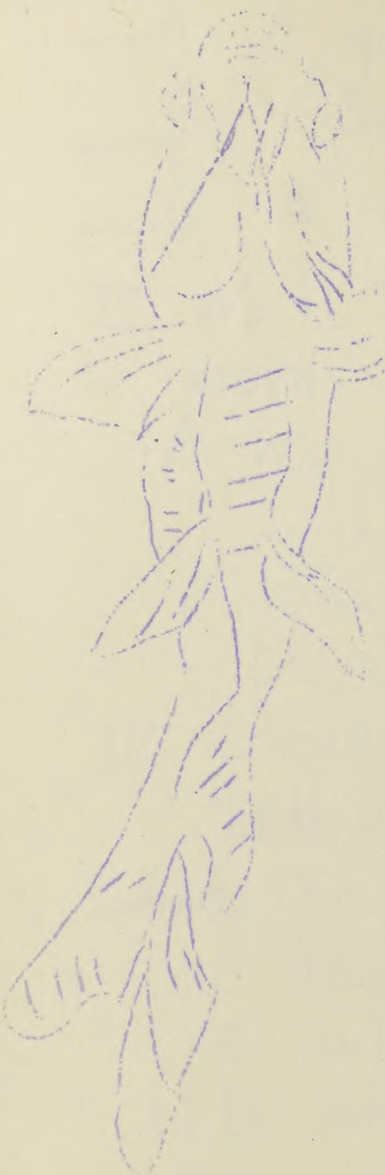
see -------- shut --------

under ------- eyesight -------

brilliant ------ small -------

Goldfish- 8-

What Makes the Goldfish Move



This is a picture of the underside of the common goldfish. He has seven fins. Two pairs are used like our hands and feet. The other three are single fins. One of these is on the back, one on the belly, and the third is the important tail. Some goldfish have no back fin, some have a double tail; but they all have two pairs of fins. These fins are something like wings. They are thin skin and are held up by fine bones. They work like a folding fan.

I. Write Yes or No to these:

___ A. A goldfish has five fins.

___ B. Sammy Goldfish has two pairs of fins.

___ C. A fin spreads like a fan.

II. Write your answers to these in a few words:

A. Why is a tail so important to a fish?

____

B. What is the underside of the fish called? ______________________

III. Check (✓) the following answers if they tell about the story:

( ) A. Things that help a fish swim

( ) B. How a fin looks

( ) C. What a fish's scales are for.

( ) D. Why it is necessary to have fish.

IV. Long words are divided into parts called syllables. You will see a number after each word. That tells the number of syllables. Then write the words in syllables. Check with the dictionary.

picture (2) pic ture

common (2) ________

pairs (1) ________

important (3) ________

goldfish (2) ________

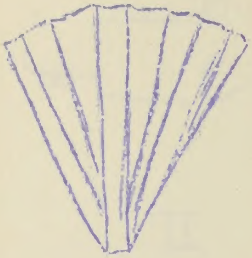
underside (3) ________

folding (2) ________

seven (2) ________

Goldfish - 9 -

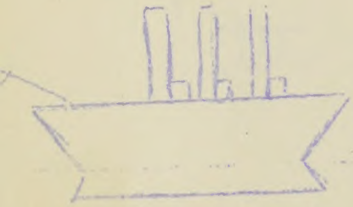
How the Goldfish Moves



This is a picture of a fin. See, it does look like a folding fan, doesn't it?

If the fish is healthy, the fins are clear and firm.

These fins are used like oars. They send the fish ahead. He can, also, stay in one place by just gently moving the fins.



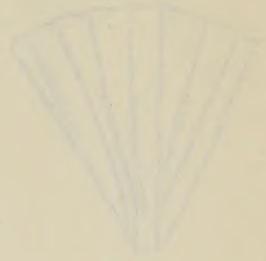
The tail is used as the rudder of a ship is used, - to turn left or right. In the picture at the left, the part below the line is the rudder. It is used to steer the ship.

The goldfish can go forward, backward, up or down. The smaller fins balance the goldfish. Without these the strong tail would make him spin around. Sometimes, to escape danger, the fish will flip his whole body to get more speed.

Goldfish-9

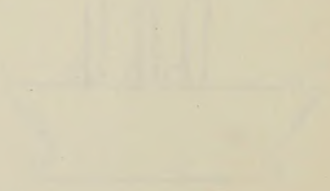
How the Goldfish Moves

This is a picture of a fin. See it does look like a folding fan doesn't it?



If the fish is healthy the fins are clear and firm.

These fins are used like oars. They send the fish forward. [illegible] also stay in one place by just gently moving the fins.



The tail is used as the rudder of a ship is used.

[illegible]

The goldfish [illegible] backward [illegible]

[illegible]

I. Write Yes or No to these:

___A. The fin tells the health of a fish.

___B. The tail is used as an oar.

___C. The fins stop the fish from swimming in circles.

II. Write the answers to these in a few words:

A. Of what use are fins?

- -

B. What would happen if a fish lost his tail? \- - - - - - - - - - - - - - - - -

III. Draw a line under the best answer:

A. The fish needs his tail as a boat needs its (sail, oar, rudder).

B. The smaller fins help to (cool, fan, balance) the fish.

C. (Fuzzy, clear, pink) fins show that a fish is healthy.

IV. Find words in the story that mean the opposite of those below:

sickly - - - - - - -
flabby - - - - - - -
muddy - - - - - - -
behind - - - - - - -

roughly - - - - - - - -
stopping - - - - - - - -
above - - - - - - - -
weak - - - - - - - -

Goldfish - 10 -

Feeding the Fish.

Did you know that a goldfish can be trained just as you train a dog? Of course, it won't do the same kind of tricks that a dog will do, but it will know when it is feeding time.

Feeding the goldfish can be very amusing and very entertaining. If you tap on the tank each time you feed the fish, it will begin to know that it is feeding time and will come to the top.

Only one person should take over the job of feeding the goldfish. If more than one person did it, the fish may be overfed. This will make the fish sick.

Goldfish like almost every type of food. You can vary their diet by giving them a pinch of ground-up dog biscuit, a pinch of oatmeal, or even a bit of cooked potato, corn, peas, or beans. Naturally, all of these foods are not served at one meal. The fish are fed only three times a week and only a pinch at a time.

Goldfish

Feeding the Fish

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Feeding the goldfish can be very amusing and very entertaining. If you tap on the tank each time you feed the fish, it will begin to know that it is feeding time and will come to the top.

Only one person should take over the job of feeding the goldfish. If more than one person did it, the fish may be overfed. This will make the fish sick.

Goldfish like almost every type of food [illegible] very [illegible]. [illegible] them a pinch of ground up dog biscuit, a pinch of oatmeal, a bit of cereal, [illegible] bread crumbs or lettuce. Naturally, all of these foods are not fed at one meal. The fish are fed only three times a week and only a pinch at a time.

I Write Yes or No to these:

___ A. It is impossible to train a goldfish.

___ B. A goldfish doesn't like very many kinds of food.

___ C. It is not necessary to feed a goldfish more than three times a week.

II. Write your answers to these in a few words:

A. Why should only one person feed the fish? ____________________

____

B. Why is it easy to keep a goldfish as a pet? ____________________

III Find a phrase in the story which means the same as a phrase below. The number will tell which paragraph has the phrase.

similar tricks (1)
meal time (1)
change their menu (4)
Of course (4)
a single person (3)
fun-giving (2)

IV Arrange these words in alphabetical order. This time look at the first two letters. The "l" in "almost" comes before "m" in "amusing."

course ______
almost 1 ____
entertaining ____
amusing 2 ____
biscuit ________
cooked ________
each ________
beans ________

[illegible] goldfish

A goldfish doesn't like very many kinds of food.

— C. It is not necessary to feed a goldfish more than once a week.

III Write your answers to these in a few words.

A. Why should only [illegible] be put in [illegible]

[illegible]

Cleaning the Water in the Aquarium

You wouldn't think of letting your house get dirty, would you? The goldfish doesn't like a dirty house either.

Cleanliness is just as important in an aquarium as it is in your home! Pieces of left-over food and bits of dead plants have to be removed from the tank before they rot and poison the water.

To remove these scraps, use a dip tube. This looks like a glass soda straw. It is twelve or fiften inches long and about a half inch wide. This is how it is used:

1. Put your finger over the top opening of the tube.
2. With your finger still in place, place the other end over the scraps you wish to remove.
3. Release your finger and the water with the bits will rise in the tube.
4. Replace your finger over the opening and remove tube from the tank.

Cleaning the Water in the Aquarium

You wouldn't think of letting your house get dirty would you? The goldfish doesn't like a dirty house either.

Cleanliness is just as important in an aquarium as it is in your home! Pieces of left over food and bits of dead plants have to be removed from the tank before they rot and [illegible] the water.

To remove these scraps, use a dip tube. This looks like a glass soda straw. It is about fifteen inches long and about a half inch wide. This is how it is used:

1. Put your finger over the top opening of the tube.

2. With your finger still in place, place the tube over the scraps you [illegible]

3. Release your finger and [illegible] will rise in the tube.

4. Replace your finger over the [illegible] from the tank.

I. Write Yes or No to these:

—A. An aquarium keeps itself clean.

—B. It is impossible to remove the bits of food and plants from the tank.

—C. Plants that have begun to rot may kill the fish.

II. Write the answers to these in a few words:

A. What is the way to remove scraps of food from an aquarium?

B. Why is cleanliness important to all living creatures?

III. Find words in the story that have the short vowel sound of "i".

IV. Find synonyms of:

allowing -------	decay -------
unclean -------	bits -------
vital -------	consider -------

Changing the Water in the Aquarium.

Using the dip tube is all right to remove scraps once in a while. The water has to be removed occasionally. This can be done without disturbing or removing the fish. You need a siphon for this task. A siphon is just a rubber hose about three feet long. This is how it is used:

1. Fill the hose with water.
2. When filled, close both ends by pinching.
3. Lower one end into the tank, which is on the table.
4. Remove your fingers from the other end which is placed in a pail on the floor.

When the tank is nearly empty, refill the aquarium the same way you did when you first set it up. Be sure the water is between sixty and seventy degrees.

Remember! Goldfish can't stand sudden temperature changes.

Changing the Water in the Aquarium

Using the dip tube is all right [illegible] scoops once in a while. The water [illegible] moved occasionally. This can be done without disturbing or removing the fish. You need a siphon for this task. A siphon is just a rubber hose about three feet long. This is how it is used.

1. Fill the hose with water.
2. When filled close both ends [illegible]
3. Lower one end into the [illegible] the table.
4. Remove your fingers from [illegible] which is placed in a pail [illegible]

When the tank is nearly empty, refill [illegible] aquarium the same way you did when you [illegible] up. Be sure the water is between [illegible] [illegible] degrees.

Remember! Goldfish can't stand [illegible] temperature change.

I. Write Yes or No to these:

___A. A dip tube is used so that the water in the aquarium never has to be changed.

___B. A siphon is a kind of snake.

___C. You refill the tank only when it is entirely empty.

II. Write the answers to these in a few words:

A. Why do you fill the siphon with water before you place one end into the aquarium? ______________________

____

B. Why do you leave a little water in the tank before you refill it?

____

III. Find words that mean:

once in a while __________ almost ______

taking out __________ annoying ______

IV. Draw a line under the best answer:

A. To remove scraps from the tank use a (rubber tube, dip tube, radio tube).

B. Refill the tank when it is (nearly, wholly, entirely) empty.

Taking Care of Sick Goldfish

Just like humans, goldfish get sick. Even with the best of care, they may get sick. So don't think you have neglected your goldfish if he does get sick.

A very common illness among goldfish is caused by a water mold that grows on the fish's scales and gills. Did you ever see a piece of bread with mold on it? It looks like white fuzz. If this happens to your pet goldfish, separate him from the other fish. Then put two quarts of water in a jar and add a teaspoon of salt. Let him swim in this solution for a half hour every day until he seems better. This may help or it may not, but there is no other remedy to save him.

I. Write Yes or No to these:

___ A. A healthy goldfish never gets sick.

___ B The salt water is a sure remedy.

___ C. Sickness may be caused by water mold.

II. Write answers to these in a few words:

A If your pet goldfish got water mold, what should you do?

____

B. What may be one of the causes of water mold?

____

III. Put the following words in syllables:

separate (3) ___________ among (2) ___________
neglected (3) ___________ humans (2) ___________
solution (3) ___________ remedy (3) ___________

IV Find words that have the long vowel "e" and make them look like this: $\bar{e}$at.

___________ ___________
___________ ___________
___________ ___________

Resolutions

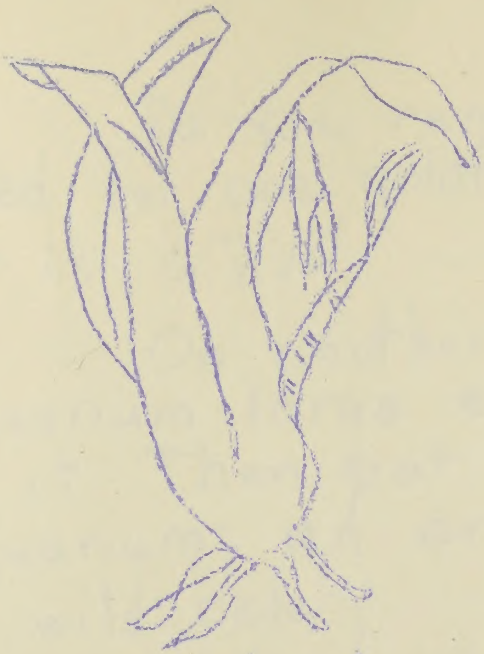
You have heard of New Year's Resolutions, haven't you? A resolution is a promise that you make to keep.

If you want to keep your fish a long time, and keep them healthy, you ought to make some resolutions. Can you think of any?

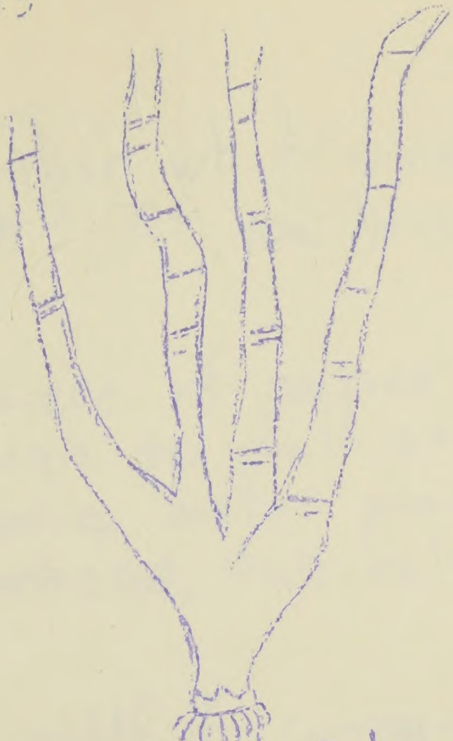
Make a list below of the things you should do and those you should not do.

Do's	Don'ts

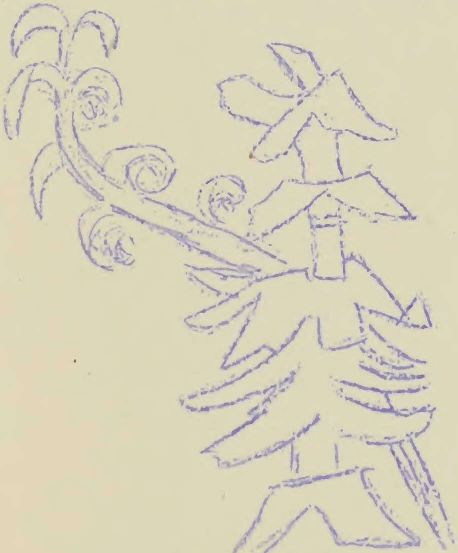
Water Plants



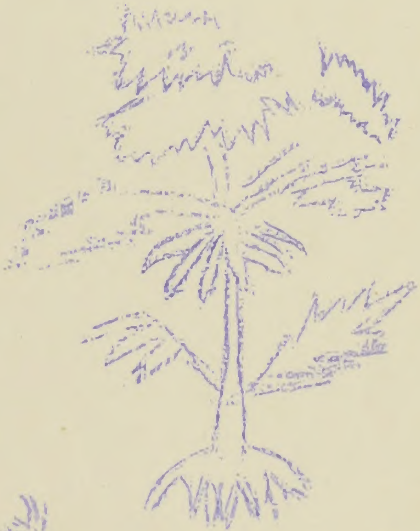
Arrowhead



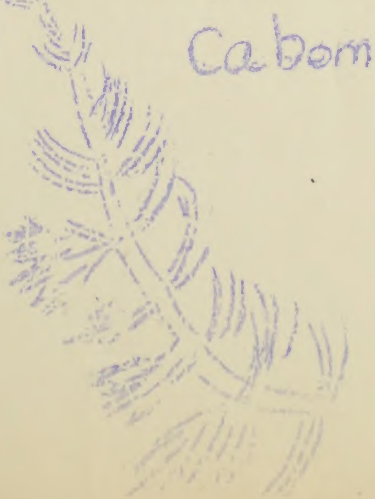
Wild Celery



Waterweed



Cabomba



Milfoil

Do you remember what size tank you'd need for one goldfish? If you have forgotten, it is 6"X10".

On another piece of paper draw an aquarium large enough to put one goldfish in it. Then put these water plants in the aquarium: an arrowhead, two milfoils, and a wild celery.

To keep the goldfish company, you may put into the aquarium a tadpole and a snail.

Water Plants

To balance your aquarium, plant waterplants in the tank. They are helpful to the fish. They furnish oxygen which is necessary for breathing. There is oxygen in water, but the fish would use it up too fast. For this reason, plants are needed to add to the supply.

You can get your waterplants either in ponds, brooks or stores that sell goldfish. After you have set your plants in the sand, put a saucer on the bottom of the tank and, slowly, let water run into it. This prevents the sand from washing away. Then fill the tank to within two inches of the top. Let it stand, undisturbed, for two days. During this time, any fine dirt will settle to the bottom.

Place the aquarium where it will get sun light, but not too much. The sunlight is necessary for the plants to make oxygen. If the plants get too much sunlight, they grow too fast and cover the sides of the tank.

Water Plants

To balance your aquarium plant water plants in the tank. They are helpful to the fish. They form oxygen which is necessary for breathing. There is oxygen in water but the fish would use it up [illegible] fast. For this reason plants are needed [illegible] the supply.

You can get your water plants either in ponds or from stores that sell goldfish. After you [illegible] your plants in the sand put a saucer on the bottom of the tank and slowly let water [illegible] it. This prevents the sand from [illegible]. Then fill the tank to less than [illegible] the top. Leave stand [illegible] [illegible] the fish [illegible] any time at the bottom.

[illegible] the aquarium where it will get [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible]

I. Write Yes or No to these:

__ A. Plants supply nitrogen to the water.

__ B. Letting the sand stand in the tank with water over it, allows the fine dirt to settle to the bottom.

__ C. Sunlight makes the plants grow faster

II. Write the answers to these in a few words:

A. How does a waterplant balance the aquarium?

- -

B. Why shouldn't you put the aquarium in the sunlight for a long time?

- -

III. Put a line under the best answer.

A. A saucer is put on the bottom of the aquarium to (wash the sand, keep the sand from washing away, pile up the sand).

B. Sunlight is necessary for (nitrogen, oxygen, carbon dioxide)

IV. Find synonyms for:

air __________

still __________

remain __________

stops __________

important __________

later __________

Snails -1-

Goldfish are like some humans because they can't get along with others. For this reason, you must choose Sammy Goldfish's companions very wisely. If you put a tropical fish with him, Sammy may eat him. Furthermore, the tropical fish need warmer water and different food.

Water snails are very easy to get along with, so you will be safe in combining them with goldfish in one tank.

A few kinds of snails are:

1. Red Ramshorn
2 Japanese
3. Pond
4. Australian Red
5. Potomac

The Potomac is the one that is born alive. The others are hatched from eggs.

The Pond Snail is the fastest moving snail and has brown stripes on its back.

The Red Ramshorn, as its name tells you, is red.

One or two snails are enough for an aquarium. They are helpful in that they keep the tank clean.

Snails

Fish are like some humans because they can't get along with others. For this reason you must choose Sammy Goldfish's companions very wisely. If you put a tropical fish with him Sammy may not get along. Furthermore, the tropical fish need warmer water and different food.

Water snails are very easy to get along with. You will be safe in combining them with goldfish in one tank.

A few kinds of snails are:

Red [illegible]
Japanese
Pond
Australian Red
[illegible]

[illegible] are hatched [illegible] snail is the [illegible] with stripes [illegible]

I. Write Yes or No to these:

___ A. Goldfish can be put with any kind of fish

___ B. A snail is a good-natured fellow.

___ C. The Potomac is the only snail that is born alive.

II. Why would it be unwise to put a tropical fish with a goldfish?

What is another reason why the tropical fish can't be put with the goldfish?

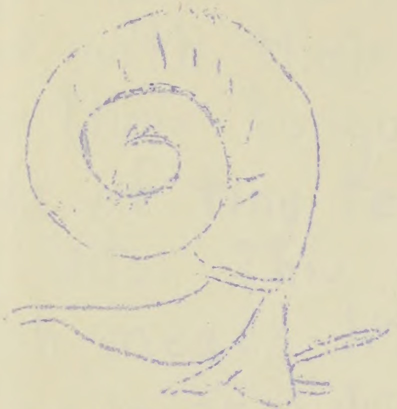
III. Check(✓) the following answers if they tell about the story:

( ) Choosing the goldfish's companions.
( ) Catching water snails.
( ) Types of snails
( ) How a snail lives

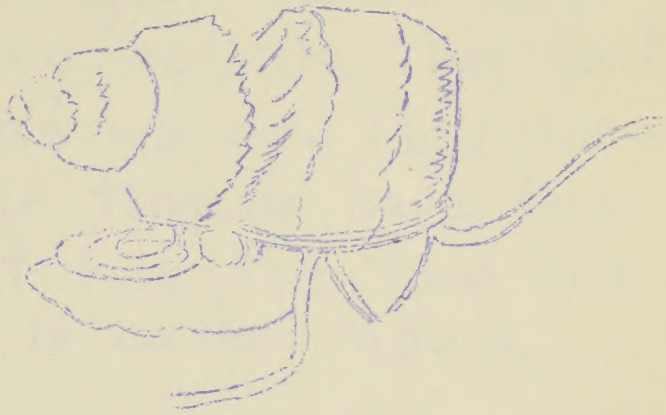
IV. Find words that have the short vowel "e" sound

Snails -2-

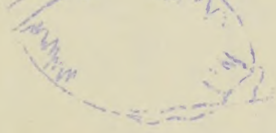
Here are pictures of some of the snails.



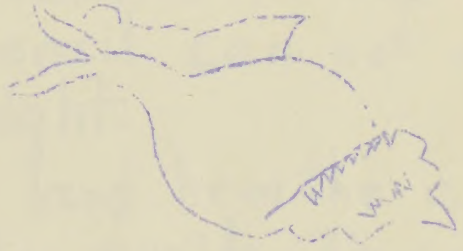
Red Ramshorn



Japanese



Pond



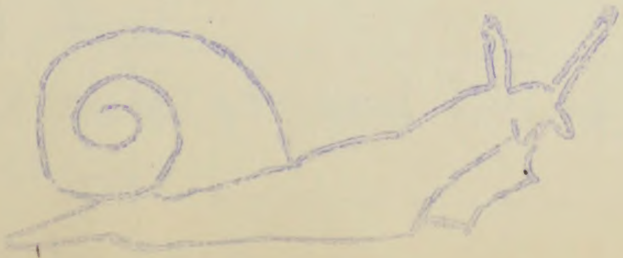
Australian Red

Write three short sentences about three of these snails.

Snails obey one of our good health laws. They chew their food very well. No, they don't chew with their teeth as we do. They chew with their tongues. Their tongues have hundreds of tiny teeth that file the food into tiny bits. This covering is called radula, which means little file.

The eyes, which look like tiny dots, are at the tip of the long antennae or feelers. Find the eyes on the feelers in the picture. Like the fish, the snail can not see objects, but it can see light.

Snails that live on the land breathe air and are hatched as little snails. Those that live in water come out of eggs as very tiny creatures with little hairs over their bodies. These tiny hairs help them swim. The water snails have shells. As the snail gets bigger, the shell adds coil after coil to fit the snail.



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l chew their food very well. They don't
ew with their teeth as we do. They chew
th their [illegible] gues. Their tongues have thou
s of tiny teeth that file the food into
bits. This covering is called radula.
ula means little file.

The eyes which look like tiny dots are
the tip of the long antennae or feelers
nd the eyes on the feelers in the gar
are like the fish the snail can not see.
jects but it can see light.

Snails that live on the land breathe
are hatched as little snails. It
water come out of eggs as
little [illegible] little larvas and then [illegible]
tiny hairs help them swim [illegible]
have shells [illegible] the snail [illegible]
the snails call [illegible] wall [illegible]

I. Write Yes or No to these;

___A. Snails chew food well with their teeth.

___B. The eyes on the antennae can see at great distances.

___C. The water snail's shell grows to fit him.

II. Write the answers to these in a few words:

A. Why does the new born water snail need so many hairs?

____

B. What is the radula for?

____

III. Arrange, in alphabetical order, the following words. Write numbers after them to show their order.

obey____ radula____ creatures____
chew____ breathe____ antennae____
tiny____ objects____ tongue____

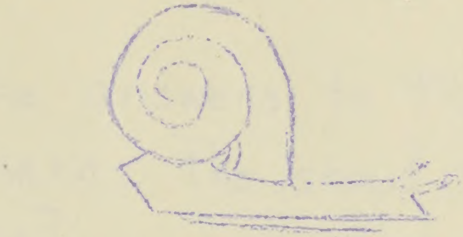
IV. Find phrases in the story that mean;

grind food______________________
follow rule of good living__________
see things______________________
take in air______________________
shell grows______________________

Snail-3-

How It Walks.

Did you ever hear anyone say, "You walk as slowly as a snail"? This story will tell you why.



Perhaps it is because the snail has to take his whole house with him, that he moves so slowly. This is how he goes for a walk:

1. He extends his body forward, as shown in the picture.
2. The forward tip anchors itself to the ground.
3. The shell, or house, is drawn forward.

The body of the snail fits into the coils of the shell, so it has to be shaped in coils. The body has to have strong muscles. These muscles pull the body into the shell when the snail's enemy appears. The horny disc on the foot closes the door of the shell.

[illegible]

[illegible] [illegible] many [illegible] [illegible] walls [illegible]
slowly [illegible] [illegible] [illegible] which will [illegible]

Perhaps this is because the snail has to take the
house with him, that he moves so slowly. This
how he cares for [illegible] house
4. It extends its body forward as shown in the
picture
5. The snail has feelers [illegible] to the ground
6. The shell [illegible] [illegible] drawn towards
The body of the [illegible] into the
shell [illegible] [illegible] found [illegible] ones. The
[illegible] have strong muscles. These
[illegible] pull the body into the shell when
[illegible] enemy appears. The [illegible]
the shell [illegible] [illegible] [illegible]

I. Write Yes or No to these:

___A. A snail is a fast moving creature.

___B. A snail has good muscles.

___C. The snail always has his house with him.

II. Write the answers to these in a few words:

A. What makes the snail such a slow-moving creature?-------------------------------

------------..---------------------------------

B. Why does a snail need strong muscles?

---.

III. Check (✓) the answers if they tell about the story.

( ) A. Why a snail walks slowly.
( ) B. Poor housing conditions of a snail.
( ) C. Muscular development of a snail.
( ) D. The snail as a food.

IV. Find antonyms in the story of:

rapidly-------------
withdraw-----------
backward-----------
part-------------
weak-----------
friend-----------
push-----------
disappear-----------

Tadpoles-1-

Now. you're going to learn all about Willie Tadpole.. Tadpole is a common name for hatched eggs of water animals that do not have tails. These are the frog and toad. Salamanders have tadpoles, but they have tails. These animals are called amphibians. Amphibians may be tadpoles from the time they are hatched from eggs until they are full-grown. The tadpole stage may last for a few weeks or two years.

Willie has a round body joined to his head, so that it is impossible to tell which is which. From the very minute Willie becomes a tadpole, he will continuously change, until, finally, he will lose his gills. His tail will be absorbed into his body. Then his legs will be full-grown, and his head will be well-shaped. This complete change from a tadpole to a toad, frog, or salamander is called metamorphosis.

I. Write Yes or No to these:

___ A. Willie Tadpole is an amphibian.

___ B. The development of a frog to a full-grown frog is called metamorphosis.

___ C. Willie always keeps his gills.

II. Write your answers to these in a few words:

A. What does amphibian mean?

B. What does metamorphosis mean?

III. Draw a line under the best answer:

A. Willie Tadpole's tail will (curl, grow, be absorbed into his body).

B. Willie's head will become (rounder, well-shaped, flatter).

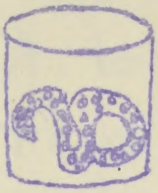
C. Willie continuously (changes, sneezes, floats).

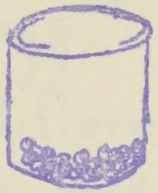
IV. Arrange these words alphabetically:

metamorphosis ( )
common ( )
amphibian ( )
gills ( )

impossible ( )
continuously ( )
absorbed ( )
may ( )

Tadpoles - 2 -


Toad Eggs


Frog Eggs

There is a difference between toad eggs and frog eggs. Look at the pictures and see if you can tell. The frog's eggs are all in a mass. What shape do the toad's eggs form? We call it string formation. Both kinds of eggs are laid with a protective covering of jelly.

We have talked about the next stage of development, which is the tadpole. Although they are different, the two tadpoles look very much alike, and they both eat waterplants.

In the full-grown animal, there are slight differences, and the development of the tadpoles into the adult animal is slightly different.

Perhaps you would be interested in getting toad's eggs and frog's eggs from a pond and watch them develop into a complete sea-animal.

I. Write Yes or No to these:

___A. Toad eggs and frog eggs look just alike.

___B. A tadpole is an egg.

___C. There are slight differences in the adult frog and the adult toad.

II. Write your answers to these in a few words:

A. Why, do you think, the eggs are laid in a covering of jelly?

- -

B. How can you tell the difference between toad eggs and frog eggs?

- -

III. Check (✓) the answer if it tells about the story:

( ) A. The development of a tadpole into a toad.

( ) B. The difference between frog's eggs and toad's eggs.

( ) C. The difference between the toad and the frog.

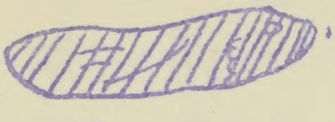
IV. In the story, find the antonyms of:

likeness__________disinterested__________

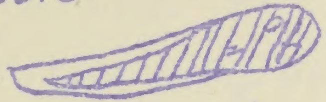
great__________unfinished__________

baby__________unlike__________

How Eggs Develop into a Tadpole.



Frog



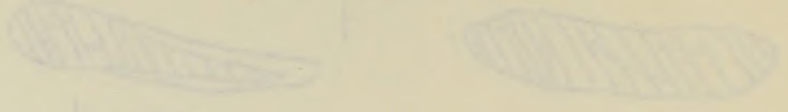
Toad

These two pictures show the second stage in the development of a frog and a toad. Do you remember what this stage is called? Yes, it is called the tadpole. They look very much alike, don't they?

Do you know what a magnifying glass is? It makes things look larger or magnifies them. If you want to watch an egg develop into a tadpole, you will need a magnifying glass.

Each egg divides itself, by a crease, into two halves. then those two halves are divided. This continues until, pretty soon, the egg looks like a very tiny gdf ball, except for its color. This dividing continues day and night, although it goes faster in the bright sunlight. The eggs will look like a bean with one end a little longer than the other. In a few days the larger end will stretch and become the tail. The smaller end will become the head.

How Eggs Develop into a tadpole.



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his dividing continues day and night, although
t goes faster in the bright sunlight. The
eggs will look like a bean with one end a
ittle longer than the other. In a few days
he larger end will stretch and become the
ail. The smaller end will become the head.

I. Write Yes or No to these:

__ A. The tadpole is the second stage of development of an amphibian.

__ B. The tadpole frog and tadpole toad are exactly alike.

__ C. You need a magnifying glass to watch a toad's egg develop.

II. Write the answers to these in a few words:

A. Why do you use a magnifying glass?

____

B. Explain how an egg develops into a tadpole. ________________________

____

III. Draw a line under the best answer.

A. After the egg continues to divide itself, it looks like a golf ball except for its (shape, color, size).

B. The bright sunlight makes the tadpole (blind, happy, hatch faster).

C. A magnifying glass makes things (lighter, larger, better).

IV. Put these words in alphabetical order:

second ( ) magnifying ( ) although ( )
stage ( ) continues ( ) crease ( )

Write Yes or No after these:

[illegible] the tadpole is [illegible] seen in stages of development or [illegible]

2. [illegible] the frog and tadpole and are [illegible] the

[illegible] magnifying glass to watch a [illegible] egg develop

[illegible] answers to these in a [illegible]

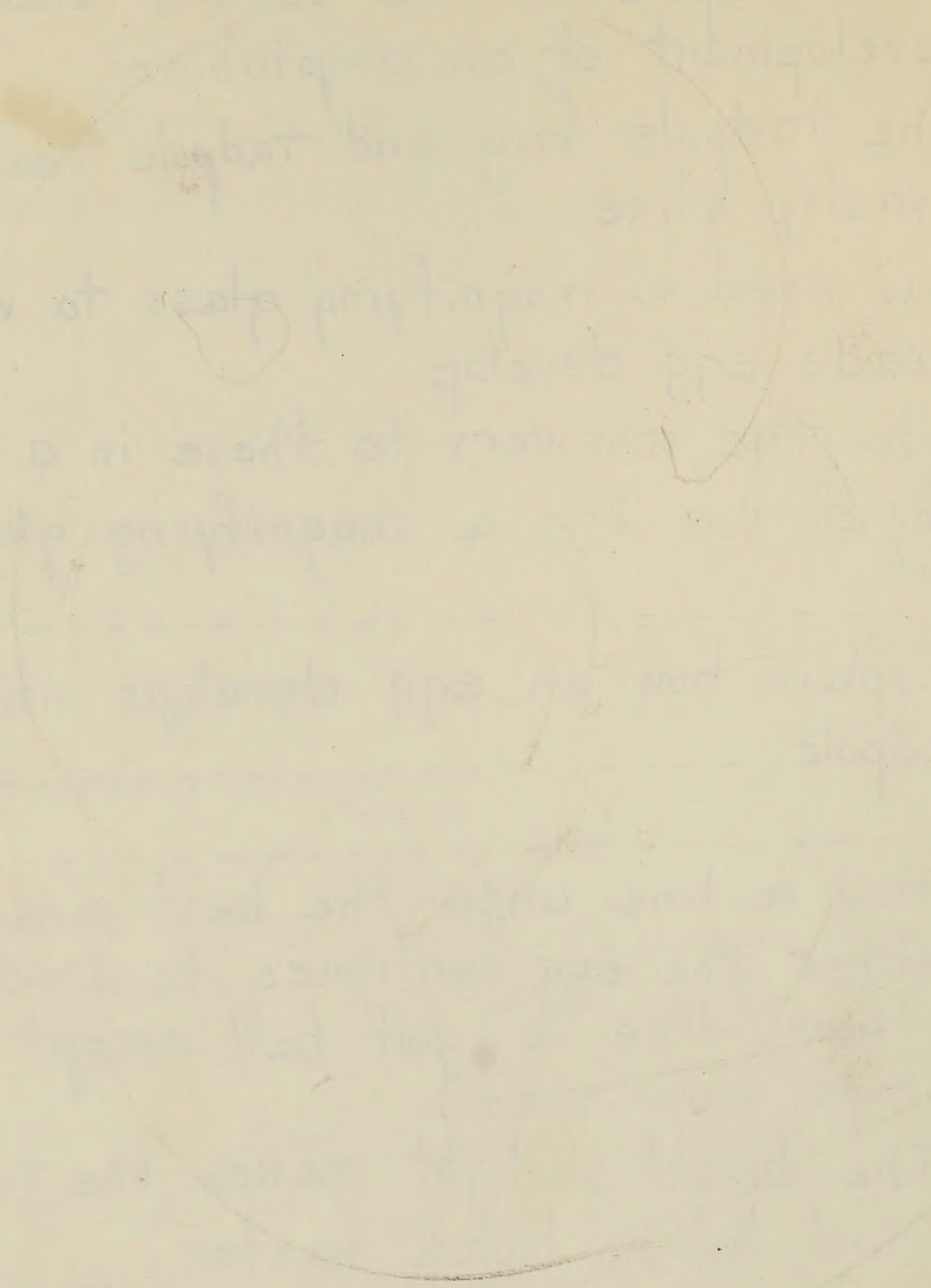
[illegible] a magnifying glass?

[illegible] Explain how an egg develops into a tadpole

[illegible] a line under the [illegible]

[illegible] the egg continues [illegible]

[illegible] half [illegible]



Tadpole -3-

A chicken hatches out of an egg with a shell. The toad's egg doesn't have a shell, but it has a covering of jelly. The pictures you saw of the eggs showed how they were held together by this jelly.

The tadpole is such an impatient fellow! In just a week after the eggs are laid, he wriggles out the jelly without eyes or mouth and just tiny gills on the sides of his head. He is just a half inch long, - totally blind and not able to eat. Can you imagine such impatience?

There is only one thing he can do. He can hold on to things. He has no hands and yet he can hold on. How strange! but here's the secret to his success. Under his chin there is something sticky in the shape of a horseshoe. With this he can hang on to the outside of the jelly.

Tadpole—

A chicken hatches out of an egg with a shell. The frog's egg doesn't have a shell but it has a covering of jelly. The picture [illegible] of the eggs showed how they were held together by this jelly.

The tadpole is such an impatient fellow [illegible] just a week after the eggs are laid, he wriggles out the jelly without eyes or mouth and just tiny gills on the sides of his head. He is just a half inch long [illegible] and not able to eat. Can you imagine such impatience!

There is only one thing he can [illegible] hold on to things. He has no [illegible] [illegible] how clamped [illegible] secret to his success. Under [illegible] [illegible] in the [illegible] with [illegible] them on [illegible] jelly.

I. Write Yes or No to these:

__A. A frog's egg hatches out of a shell.

__B. The eggs are held together by jelly.

__C. The tadpole has very good eyesight.

II. Write the answers to these in a few words:

A. How does a tadpole hold on? __________

____

B. Why does the tadpole hang on instead of swimming off? ____________

____

III. Find phrases in the story that mean:

were joined together ____________.

couldn't see at all ____________.

just couldn't wait ____________

squirms out of the jelly ____________

IV Find words that have the long vowel sound of "a". Write them on the lines below.

____________ ____________

____________ ____________

____________ ____________

____________ ____________

Do you remember the purpose of the fish's gills? Tadpoles' gills are used for the same reason – for breathing. The gills take the oxygen from the water. They look like three feathery ferns on either side of the tadpole's head.

We have already said that the tadpole is impatient. By the middle of the second morning, he gets tired of hanging onto the jelly and swims off into the pond. Hasn't he courage?

Poor tadpole! he can't swim very gracefully because his tail is too short. Worse than that, he doesn't know where he is going because he has no eyes. On the third morning, he'll be able to see the sunlight. Then he won't bump into everything.

Tadpoles-3

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I. Write Yes or No to these:

___A. Tadpoles' gills are used for breathing.

___B. The gills are round and thick.

___C. The tadpole is impatient.

II. Write the answers to these in a few words:

A. How did the tadpole show his courage?

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B. Why couldn't the tadpole swim skillfully?

------------------------

III. Find phrases in the story that mean:

resemble feathery ferns________________

got bored____________________

have spunk____________________

At last____________________

IV. Check (✓) the answers if they tell about the story:

( ) A. The tadpole's first swimming lesson.

( ) B. The tadpole's courage.

( ) C. How a tadpole thinks.

( ) D. Catching tadpoles.

Do you know what a dimple is? Do you know anyone who has one? The tadpole isn't going to be outdone by us humans. He has a dimple, too. However, his dimple isn't for beauty. It is very important in his development. This dimple gets larger until it becomes the mouth. It continues to grow until it reaches the stomach.

Sometimes the tadpole gets so hungry he even eats his brothers and sisters. He is just like a cannibal. Most times he is satisfied with the scum of the waterplants and remains of food that the other animals eat.

You know where tadpoles come from, but long ago, people thought they came from mud. As time goes on, we learn more and more about everything.

I. Write Yes or No to these:

___ A. The dimple makes the tadpole beautiful.

___ B. The dimple becomes the stomach.

___ C. The mouth grows until it reaches the stomach.

II. Write the answers to these in a few words:

A. In what way is a tadpole like a cannib

- -

B. How are people at the present better off than those who lived long ago?

- -

III. Find synonyms in the story for:

"beaten" ________ Usually ________

vital ________ left-overs ________

Keeps on ________ eats live creatures ____

IV. Put a line under the best answers:

A. The tadpole's dimple is for:
(beauty, usefulness, breathing).

B. The tadpole is a cannibal when he ea
(remains of food, scum of plants, his broth

C. Long ago, people were not as
(beautiful as we, well-informed as we,
as brave as w

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